

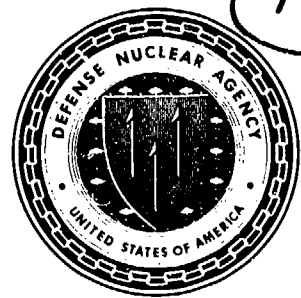
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**Nuclear Employment Planning
Volume I—Main Report**

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13. ABSTRACT (Maximum 200 words) This report contains four volumes, Main Report (Volume I), Functional Description (Volume II), Data Flow Diagrams (Volume III), and Data Dictionary (Volume IV). The objective of this report is to define user planning requirements for tactical nuclear weapons employment. It identifies the nuclear planning employment functions at corps and division echelons, the interfaces among these functions and the interfaces between these functions and other command and control (C2) functions. It is intended that it be used as the basic requirements document for the automation of the nuclear employment planning process as part of the Army Tactical Command and Control System (ATCCS). The Functional Description (Volume II) of the report provides a menu of functions (processes) which, depending on the phase of nuclear employment must be performed to plan for the use of nuclear weapons at corps and division echelons. The processes have been decomposed to five levels of resolution. The Data Flow Diagrams (Volume III), depict the flow of process inputs and outputs, both among the planning processes themselves, as well as between the nuclear employment planning processes and organizational C2 nodes and entities performing other C2 processes. The Data Dictionary (Volume IV), provides a single place to find the full names and definitions of the data terms used in the Functional Description and Data Flow Diagrams. Mission Thread Diagrams found in Volume I (Main Report) supplement the Data Flow Diagrams in that they show the sequence of processes as they are performed in one phase of nuclear planning. Commander's guidance as it applies to nuclear employment planning is discussed separately in the Main Report and interwoven throughout the data flow diagrams, functional descriptions and the data dictionary. All of these elements make up this report and must be viewed together to get the overall picture of the Operational Nuclear Employment Planning Process. (787)				
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SECTION 1

INTRODUCTION

1.1 PURPOSE OF REPORT.

This report forwards and explains the contract deliverables for Tasks 1b, 1c, 2, and 3 of the Defense Nuclear Agency (DNA) Small Business Innovative Research (SBIR) Phase II project (Contract #DNA 001-88-C-0068), entitled Operational Nuclear Employment Planning. The contract was awarded on 11 July 1988 and was scheduled to be completed in a period of 18 months. The contract tasks are shown in the statement of work which is attached as Appendix A. This work is sponsored by the Defense Nuclear Agency RDT&E RMSS code B4662 D RN 00003 PR AS 1940A.

1.2 SCOPE OF PROJECT.

This SBIR Phase II project describes the nuclear employment planning functions performed at the corps and division command echelons. The functions represent the nuclear employment planning requirements of four battlefield functional areas (BFA): Maneuver Control, Fire Support, Intelligence, and Combat Service Support. The specific planning requirements for nuclear weapons employment are those subsets of command and control functions which are common or shared among battlefield functional areas or unique to a single BFA as depicted in Figure 1. No soldier-machine allocation of functions is included.

1.3 OBJECTIVE OF PROJECT.

The primary objective of the Operational Nuclear Employment Planning project is to define user planning requirements for nuclear weapons employment at a level commensurate with an "A" specification.

The identification of nuclear employment planning functions at corps and division echelons, the interfaces among these functions, and the interfaces between these functions and other command and control functions serve as an A-type requirements document. It is intended that this report be used as the basic requirements document for the automation of the nuclear employment planning process as part of the Army Tactical Command and Control System (ATCCS). Additional utilization of the products of this project are discussed in Section 7.

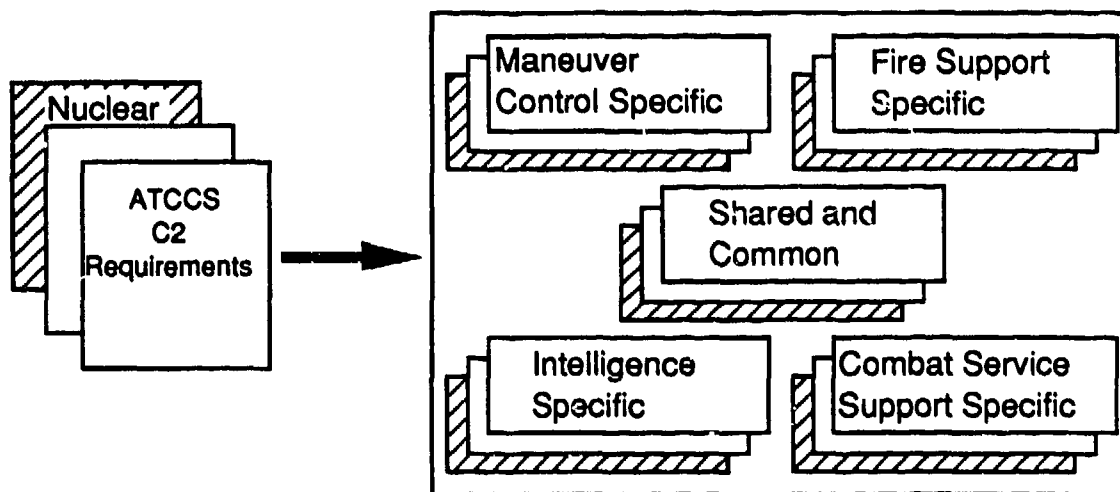


Figure 1. The subsets of nuclear requirements.

1.4 BACKGROUND.

1.4.1. Problem Recognition.

The Defense Nuclear Agency recognized the need and opportunity for automating nuclear planning processes as part of the Army's efforts to develop an automated command and control system. DNA offered "Operational Planning" as a nuclear employment topic in its 1986 Phase I SBIR Program solicitation. LB&M Associates, Incorporated, bid on and was awarded a six-month, Phase I SBIR contract to study the issue of nuclear operational planning. The contract began in September 1986.

1.4.2 Phase I SBIR.

LB&M Associates delivered its Phase I study, entitled "Operational Nuclear Planning", to DNA in March 1987. The study pointed out that nuclear employment functions had not been identified in the Functional Definition of the Advanced Field Artillery Tactical Data System (AFATDS) to be initially fielded. The study also pointed out that other BFAs were in the process of developing the requirements for their respective areas. The study recommended that a nuclear employment functional analysis of the battlefield functional areas subordinate to the ATCCS be conducted in order to ensure that the capability for automated nuclear employment was considered during ATCCS development. On the basis of the Phase I conclusions, DNA requested that LB&M submit a proposal for a Phase II SBIR to accomplish the functional analysis.

1.4.3 Phase II SBIR.

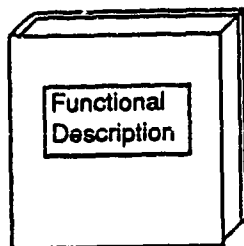
In July 1988 LB&M Associates was awarded the Phase II SBIR contract by the Defense Nuclear Agency to build upon the Phase I work and develop the capability for potential automation of the operational nuclear employment planning process further by performing a functional requirements analysis. The goal of this project was to develop a documented list of the nuclear planning functions being performed by four of the five BFAs, Maneuver, Fire Support, Intelligence/EW, and Combat Service Support. Once the functions were identified a top down functional requirements analysis was to be performed. The specific tasks of the Phase II project can be found in Appendix A, Statement of Work.

1.5 SUMMARY OF DELIVERABLES.

Six contract deliverables are included with this final report.

1.5.1 Functional Description.

The Functional Description provides the basis of an A-type requirements document. The Functional Description is a "menu" of functions (processes) which, depending upon the phase of nuclear weapons employment planning, must be performed to plan for the use of nuclear weapons at the corps and division organizational levels. The processes in the Functional Description have been decomposed to the fifth level of resolution. The Functional Description was developed from current Army doctrine on command and control and nuclear weapons employment planning and is described in detail in Section 2 of this report and included as Volume II.



PLAN FOR THE EMPLOYMENT OF NUCLEAR WEAPONS

1 Acquire, Maintain, And Transmit Information.

PROCESS DESCRIPTION: To gather information on nuclear employment-related mission requirements, the friendly and enemy situation and status, and the environment; to secure and maintain nuclear employment-related information in useable form; and to disseminate nuclear employment-related information. (AC2MP, pp. 2-4, 2-5)

INPUTS: External reports; Estimates; Standard procedures; Doctrine; Higher headquarters directives; Formatted directives; Concept for the employment of nuclear weapons; Assessment of the situation; Nuclear employment package/subpackage information; Information queries; Formatted requests/reports.

OUTPUTS: Reports/requests; Directives.

LOCATION: Command posts.

PROCESSOR: Commander and staff.

1.1 Manage Communications.

PROCESS DESCRIPTION: To provide for the establishment, security, and control of the means and modes of communications required for the timely and effective employment of nuclear weapons. (TRADOC Pam 11-9, p. B-7)

INPUTS: Higher headquarters orders/plans; External status reports; Analysis of the nuclear employment aspects of the mission; Commander/staff officer estimates; Authorization documents; SOP's; Communications doctrine; Nuclear weapons employment doctrine.

OUTPUTS: Nuclear weapons employment input to the communications-electronics annex.

Figure 2. Functional description.

1.5.2 Data Flow Diagrams.

The Data Flow Diagrams depict the flow of process inputs and outputs, both among the nuclear employment planning processes themselves as well as between nuclear employment planning processes and organizational command and control nodes and entities performing other C2 processes. Data flow is shown without regard to the sequence of process performance. The Data Flow Diagrams are a second part of the A-type requirements documentation. The diagrams are described in detail in Section 3 and included as Volume III.

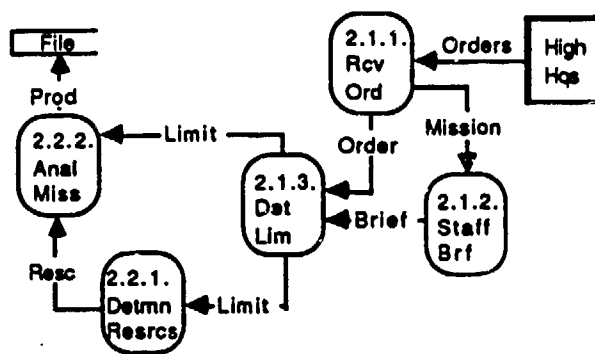


Figure 3. Data flow diagram.

1.5.3 Data Dictionary.

The Data Dictionary rounds out the A-type specification of nuclear employment planning by defining and providing data relationships for all data used as inputs and outputs for processes defined in the Functional Description. The Data Dictionary is explained in detail in Section 3 and included as Volume IV.

NAME	DATA TYPE	COMPONENTS	ALIASES	RELATED DATA	REMARKS
Air-Spt-Plan	data structure	Air-Conv-Tgt-List	None	None	Air Support Plan. The document developed and used in the fire support planning process which details how air assets will be used in support of the mission to be accomplished.
Alt-COA-for-Nuc-Emp-Pln-P'frm	data structure	Alt-NW-Spt-COA-Acc-Pri-Msn Citing-Roles-NW-COA-Br-Seq	None	Adv-Assoc-Emp-NW-Ea-COA	Alternative Courses of Action (COA) for Which Nuclear Employment Planning is to be Performed. Those COAs not selected by the commander for execution of a mission but for which he desires nuclear employment planning.
Alt-Nuc-Wons-Spt-Crs-Action	data structure	Alt-NWons-Spt-Mvr-Schemes Anal-of-Relative-Cmbt-Power COA-Sketches NWons-Spt-COA-Simls Input-NW-Sptd-COA-Simls COA-Nuc-FC-Msr-Sketches	None	Adv-Disadv-Each-NWons-Spt-COA Mod-Course-of-Action	Alternative Nuclear Weapons-Supported Courses of Action. Those candidate nuclear weapons-supported courses of action which will provide for accomplishment of the mission while meeting commander's guidance.
Alt-NW-Spt-COA-Acc-Pri-Msn	data structure	TBD	None	None	Alternative Nuclear Weapons-Supported Courses of Action (COA) to Accomplish Primary Mission. Secondary COAs not selected as the basis for mission execution but which the commander desires retained for contingency planning.

Figure 4. Data dictionary.

1.5.4 Mission Threads.

Mission Thread Diagrams supplement the Data Flow Diagrams in that they show the sequence of processes as they are performed in the four phases of nuclear employment planning. Mission threads provide a basis for training literature development and are further described in Section 4.

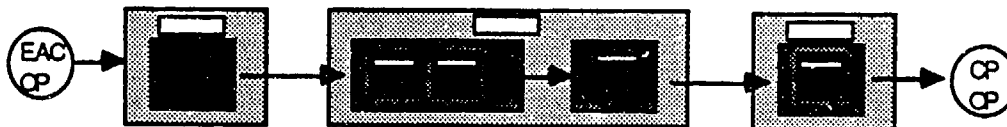
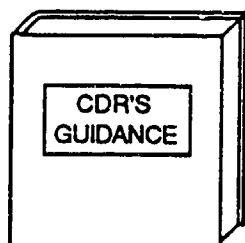


Figure 5. Mission thread diagram.

1.5.5 Commander's Guidance.

Commander's guidance plays a critical role in nuclear employment planning. LB&M has provided a broad view of those information requirements which form the basis for nuclear employment planning default data and planning parameters. Nuclear Weapons Employment Commander's Guidance is described in greater detail in Section 5 of this volume.



F.2 SYSTEM NONSPECIFIC GUIDANCE.

F.2.1 Attack Guidance. Guidance under this heading includes items established for all fire support nuclear-capable attack systems. System nonspecific attack guidance for nuclear weapons will typically be established at the corps, but may be established at the division as well.

F.2.1.1 Conditional Employment Guidance.

Purpose: Allows the commander to direct or restrict the use of one or more types of nuclear-capable attack systems by period of time, in specific areas, against specific target types/subtypes, or a combination of these.

Rationale: A commander may desire to set restrictions in order to reserve fire support assets in short supply, such as Air, for upcoming operations. He may set this guidance to provide for safety of troops that are passing through an area in a specified period of time. He may direct the use of certain fire support assets in an area or at a given time for the same reasons. He may direct specific fire support assets against specific targets because his experience factor assures him they are capable of achieving his battle goals. A commander may desire to change the guidance set here as the plan or battlefield situation dictates.

Default: None.

Types of Entries:

- Attack Systems: Air, FA. At this level, entries refer to all aircraft, or all FA systems.
- Condition: Directed, Restricted.
- Time: Inclusive date-time group for which the condition exists.

- Area: Description of the area in which the condition exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.

- Target Type/Subtype: The list of target types/subtypes against which the condition exists.

- Source: Unit ID. This identifies the commander who directed or restricted the attack system. It tells other operators from which commander to request permission if they wish to override the guidance.

Other Guidance Affected:

- Excluded target attack guidance. Specific fire support systems may be directed or restricted against certain target types/subtypes in this item of guidance. Excluded target attack guidance should be checked to ensure that the same target types/subtypes have not been excluded for that particular fire support system (and/or at that particular time, and/or in that particular area, etc.), thus causing a conflict.

- Munitions conditional employment guidance. Directing or restricting munitions in specific fire support systems under this item of guidance may conflict with guidance set under munitions conditional employment, causing inadequate coverage of the target area or less-than-desired effects on targets.

Figure 6. Commander's guidance.

1.5.6 Nuclear Employment Training Observations.

Although not a requirement of the contract, LB&M compiled a number of observations of US Army nuclear employment training during the course of this study. These observations, inspired by visits to Army units and training institutions, lead to a recommendation to integrate employment training into Army exercises as a means to ensure a progressive and continued capability in this area. The observations are further explained in Section 6.

SECTION 2

FUNCTIONAL DESCRIPTION

2.1 GENERAL.

This section explains the Functional Description of nuclear employment planning processes. The Functional Description is meant to serve as a menu of functions which must be performed during one or more of the phases of nuclear employment planning described in Army doctrine (see Section 4). Functions are those actions which are performed to accomplish nuclear weapons employment planning at the corps and division levels. Within the Functional Description nuclear employment functions are structured in hierarchical fashion with the top level (level 1) being the most general functions. Each of the four top-level functions has been decomposed into its constituent, subordinate functions. Subordinate functions are further decomposed into their constituent functions and so on to the lowest level of detail. Figure 7 presents a view of

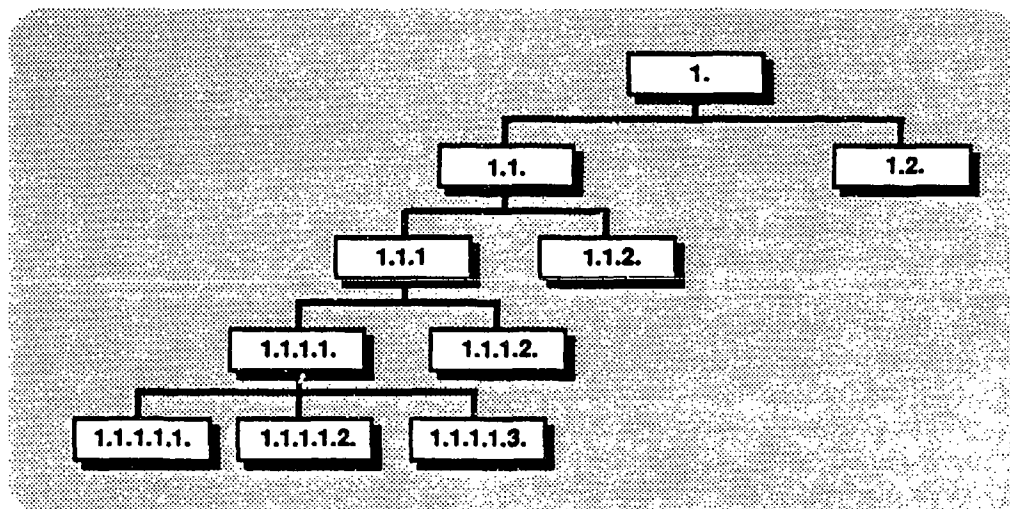


Figure 7. Structure of functional hierarchy.

the structure of this functional decomposition. Each function is decomposed to a maximum of five levels. Five levels of decomposition is adequate to describe most functions and approximates the level of detail found in the Fire Support Functional Definition published by the US Army Field Artillery School. Not all functions are decomposed to the fifth level, as some functions could be described in sufficient detail in four levels or, in one case (Process 4.3.2.), three levels.

2.2 BASIS OF DEVELOPMENT.

US Army command and control doctrine and knowledge acquisition visits to TRADOC Centers and unit headquarters served as the bases for the development of the Nuclear Employment Planning Functional Description.

2.2.1 Source of Top-Level Functions.

The processes in the Nuclear Employment Planning Functional Description were envisioned as candidates for incorporation in the Army Tactical Command and Control System. Therefore, the Nuclear Employment Planning Functional Description was based on the four prime command and control functions described in the Army Command and Control Master Plan (AC2MP). The AC2MP describes these four top-level functions as ACQUIRE, ASSESS, DETERMINE, and DIRECT. These four functions were adapted to nuclear weapons employment planning by modifying their titles to more precisely describe their subset of nuclear employment command and control processes. As renamed they are ACQUIRE, MAINTAIN, AND TRANSMIT INFORMATION; ASSESS SITUATION; DETERMINE NUCLEAR EMPLOYMENT CONCEPT; and DIRECT NUCLEAR EMPLOYMENT OPERATIONS.

2.2.2 Sources of Subordinate Functions.

While the AC2MP adequately defines the highest level command and control functions, it does not decompose them into their respective subordinate functions. Therefore, two additional sources were used to assist in transitioning from the highest-level functions down to the lower-level, nuclear employment-specific functions. The first source, the Blueprint of the Battlefield (TRADOC Pamphlet 11-9), provided a general decomposition of functions for command and control which was based on essentially the same four top-level functions which are found in the AC2MP. The second source, The Command Estimate (CGSC Student Text 100-9), provided extensive functional detail under the top-level functions of ASSESS and DETERMINE. From these two sources the majority of mid-level command and control functions (e.g. DEVELOP COURSES OF ACTION) were identified.

2.2.3 Sources of Nuclear-Specific Functions.

Nuclear weapons employment-specific functions were identified in two ways. First, high- and mid-level planning functions which had distinct nuclear employment components were identified. There is an extensive commonality between nuclear weapons employment functions and "traditional" command and control planning functions. The relationship between the two being that nuclear employment processes form a subset of the general command and control functions. (For example, virtually all of the nuclear employment functions under the top-level function ACQUIRE, MAINTAIN, AND TRANSMIT INFORMATION must be performed by a military organization regardless of the type weapons to be used, environment encountered, or nature of operations contemplated.) Second, nuclear employment doctrine was examined and lower-level employment tasks identified (see Appendix C for a list of references used). Nuclear weapons employment-specific functions were then integrated into the hierarchy formed from the higher-level functions.

2.3 EXPLANATION OF ENTRIES.

As illustrated in Figure 8, each process is addressed in the Functional Description in a format which includes the process title followed by five paragraphs which provide information concerning the process.

4.1.1.3 Consider Preclusion Information

PROCESS DESCRIPTION: To adjust weapon aimpoints and/or yields based on requirements to preclude collateral damage and obstacles and to conform to troop safety requirements. (FM 6-20-30, p. C-6-7)

INPUTS: Weapons, yields, and heights of burst for each identified target; Required target damage; Initial target aimpoints; Guidance on preclusion of collateral damage and obstacles; Guidance on troop safety requirements; Maneuver unit locations; Commander's course of action description.

OUTPUTS: Proposed nuclear package/subpackage. (Requests for friendly unit current and projected locations may be directed to the "Determine Information Needs" function.)

LOCATION: Fire support cell, main command post.

PROCESSOR: Target analyst.

Figure 8. Sample process entry.

2.3.1 Process Description.

The first paragraph is the process description which explains what the process entails. Following the explanation is the doctrinal reference from which the process was extracted or inferred. Inferred means that, within the context of this analysis, a stated generic command and control function was restructured so as to be directly related to nuclear weapons employment. For example, from the general command and control function IDENTIFY SPECIFIED TASKS, the process IDENTIFY SPECIFIED NUCLEAR TASKS was inferred.

2.3.2 Inputs.

Nuclear employment process inputs are those elements of data required in order to perform the process described. Process inputs come from the commander, from other command echelons, from stored data (such as doctrine and standing operating procedures), from the performance of general command and control processes, and from the performance of other nuclear weapons employment planning processes. It should be understood that, because of the level of decomposition of inputs at the lower level processes, in a given tactical situation all elements of planning data may not be available, while others may be incorrect or outdated.

As nuclear employment planning functions were decomposed in the Functional Description, their inputs and outputs were decomposed into their respective constituent elements. Figure 9 shows an abridged example of how the top-level input "External Reports" decomposes within the Functional Description. The data dictionary (Volume IV) describes the relationships of all input and output data.

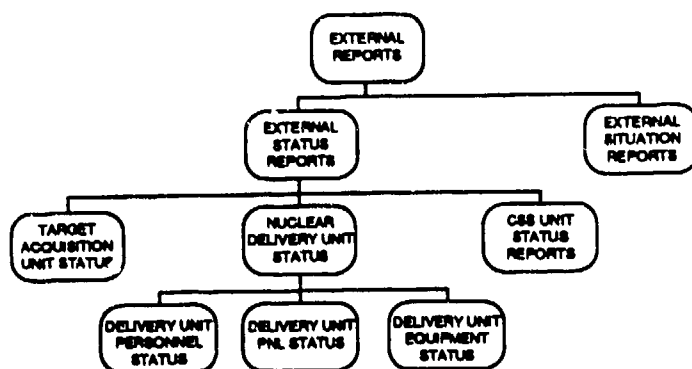


Figure 9. Example input decomposition.

2.3.3 Outputs.

Nuclear employment process outputs are the data generated as a result of performing the process described. Process outputs may become inputs or products to other command echelons, to general command and control processes, or to other nuclear weapons employment planning processes. Volume III illustrates the flow of nuclear weapons inputs and outputs.

2.3.4 Location.

The Location entry indicates where, within a force command post, the nuclear employment planning function is performed. In some instances more than one location is indicated. When more than one location is listed it is generally due to different staff officers or staff sections performing like functions. For example, the process IDENTIFY SPECIFIED NUCLEAR TASKS normally would be performed by the majority of primary staff officers at their respective command post cells.

2.3.5 Processor.

The Processor entry indicates the individual(s) who perform(s) the process described. Doctrinal references such as field manuals tend to attribute the performance of functions to a primary or special staff officer. The individual who performs a specific function will often be a matter of unit or staff section standing operating procedure. Consequently, in most cases in the Functional Description, a primary or special staff officer is shown as Processor, when in fact a subordinate within the respective section may actually perform the function. Nevertheless, the Processor entry provides a basis from which a determination of which battlefield functional area (or areas) is responsible for the performance of a given function. For example, functions performed by the FSCoord would reside within the Fire Support battlefield functional area and thus be candidates for inclusion into the Advanced Field Artillery Tactical Data System. Furthermore, the focus on the human processor will aid subsequent soldier-machine allocation efforts within the ATCCS.

2.4 VALIDATION OF PROCESSES.

The doctrinal validation of the Functional Description presented with this report took place throughout its development. Upon completion of the third level of the function hierarchy the Functional Description was reviewed by the Battlefield Nuclear Weapons (BNW) Division of the Concepts and Force Alternatives Directorate, Combined Arms Combat Developments Activity, Fort Leavenworth, Kansas. The BNW's comments

were incorporated into the Functional Description as the fourth-level functions were being identified.

Upon completion of the fourth-level hierarchy, the Functional Description was again reviewed by the BNW and comments provided to LB&M Associates. In addition, copies of the fourth-level Functional Description were sent to selected TRADOC Centers and to field headquarters for review. Representatives from LB&M Associates and the Defense Nuclear Agency visited the following organizations to receive their comments on the validity and accuracy of the Functional Description.

- TRADOC Program Integration Office, ATCCS, Fort Leavenworth
- C2 Directorate, CACDA, Fort Leavenworth
- TRADOC Systems Manager, CSSCS, Fort Lee
- US Army Missile and Munitions Center, Redstone Arsenal
- US Army Signal Center, Fort Gordon
- US Army Intelligence Center, Fort Huachuca
- US Army Field Artillery Center, Fort Sill
- Headquarters, CENTAG, Federal Republic of Germany
- Headquarters, V Corps, Federal Republic of Germany
- Headquarters, 3d Armored Division, Federal Rep. of Germany

During the visits, the organization representatives were briefed on the overall nuclear employment planning project and comments on and corrections to the Functional Description were solicited. At each organization visited by the LB&M and DNA representatives the work was well received and only minor comments were received. Comments which were received were incorporated into the Functional Description and fifth-level functions identified. The fifth-level Functional Description was sent to the Battlefield Nuclear Weapons Division for final review and the one comment received was incorporated into the document. Summaries of the visits to TRADOC centers and to field headquarters are included as part of Appendix B.

SECTION 3

INFORMATION FLOW

3.1 GENERAL.

The purpose of this Section is to describe the development of the Data Flow Diagrams and the Data Dictionary found in the Volumes III and IV respectively of this report. The Data Flow Diagrams and the Data Dictionary are addressed together in this section because they must be used together to understand the flow of information in the Operational Nuclear Employment Planning process described in this report.

3.2 DATA FLOW DIAGRAMS.

The Data Flow Diagram is a network representation of a system. It portrays the system in terms of its component pieces and the flow of information within the system. The Data Flow Diagram shows the flow of data and not the control of data. The most significant characteristics of a Data Flow Diagram are: (1) it is a graphic representation; (2) it shows how processes are partitioned; (3) it emphasizes the flow of data in the system; (4) de-emphasizes flow of control of data. In this report, four basic icons are used to represent the flow of data in the system. They are described in the following sub paragraphs.

3.2.1 External Entity.

An External Entity represents either a source of data or the destination of the data. This entity exists outside the system. It typically represents a person or place that acts as a source of information or a repository of information.



3.2.2 Process.

A Process represents the transformation of information that occurs inside the system. When data enters the process, it is in a particular form. The process is a data transformation agent in that it may change the form of the data, extract data, decompose data or synthesize data.



3.2.3 Data Store.

A Data Store represents a location for storage of data which is critical to the system. This data is temporarily deposited in this location until it is needed by a process. You can think of this as a Data Base. It is an internal part of the system.

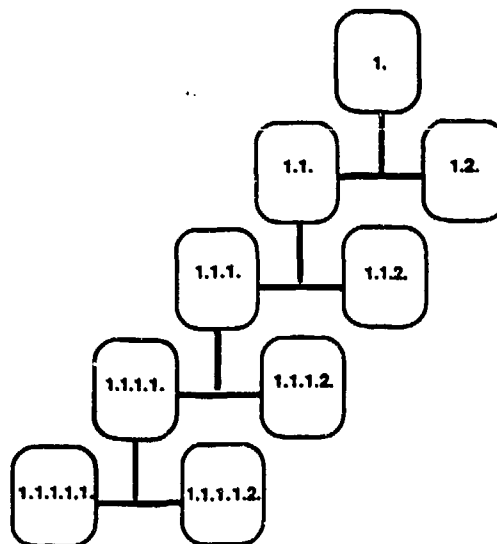


3.2.4 Information Flows.

These represent one- or two-way connections between external entities, stores, and processes. The name of the data which travels on this information path is usually given on top of the arrow.



Each process is given a number to represent a step in the overall system. In this project, the numbering scheme of each process proceeds from the top level down to, and includes, five levels of decomposition, as shown by the example below.



The completed document reflects the hierarchical structure of the data flow for the Operational Nuclear Employment Planning process described in this report to five levels of decomposition. An example of a data flow diagram from the report is shown in the figure below. This figure illustrates two processes (1.1.1 and 1.1.2) which are part of (1.1). Data enters the system from the Cdr/Staff and External HQs. Data is stored in the system in an Information Base. Connections can be seen which exist for other parts of the system (process 2 and subprocesses 1.2 and 1.3).

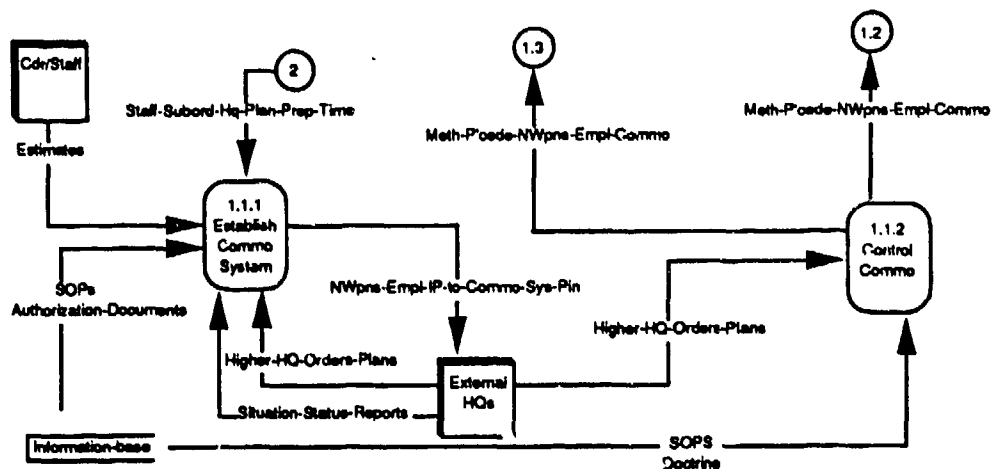


Figure 10. Example data flow diagram.

The Data Flow Diagrams for this project can be found in Volume III of the report.

3.3 DATA DICTIONARY.

A Data Dictionary is a collection of information about the data defined for the system. It is a set of hierarchically structured, logical definitions for each of the data terms used in the data flow diagrams for the Operational Nuclear Employment Planning Process described in this report. Each data term, or character string, is limited to 30 characters, which includes all hyphens.

Neither the Process names nor the External entity names are considered data terms.

The most important role of this dictionary is to provide a single place to find the full names and definitions of the data terms. The Data Dictionary is an integral part of the project description. With it, the data flow diagrams in Volume III illustrate what is taking place in the system being described. All elements of the data flow diagrams have been defined for the five levels of decomposition described in this report.

The data in the Data Dictionary is categorized as one of five types of data used to describe the Operational Nuclear Planning Process in this report.

3.3.1 Basic Data.

Basic data is a type of data which cannot be meaningfully broken down into smaller components. This data is usually described in terms of legal entries or values. For example, one basic data element found in this report is labeled Date-Time-Group, it is represented as alphanumeric values expressing date and time or 051030AFeb90. (Which is 10:30am, February 5, 1990 in the Alpha Time Zone)

3.3.2 Data Structure.

The data structures found in this report are a combination of other data or components. At the level of decomposition discussed and depicted in this report all data structures will not be shown to their lowest level components. In those instances where further decomposition is required to identify the lower components the term TO BE

DETERMINED (TBD) is used. Each component part of the data structure definition becomes a Data Dictionary entry in itself. For example, Nuc-Emp-IP-D'cpt-Anx (Nuclear Employment Input to the Deception Annex) is a Data Structure composed of Descr-Nuc-Asps-D'cpt-ConC (Description of the Nuclear Aspects of the Deception Concept) and Nuc-Emp-D'cpt-Tasks (Nuclear Employment Deception Tasks).

3.3.3 Aliases.

An Alias is a synonym for a data element which surfaces in the data flow diagrams of this report because the item has been called a different name elsewhere in the data flow diagram. An alias has no definition of its own. It is only a reference to the main name. An example of an alias found in the data dictionary of this report is F'Matted-Requests-for-Info which is an alias of Formatted-Req-for-Info.

3.3.4 Data Store.

A Data Store is a temporary resting place for information until it is needed by a process in the system. Data stores are dynamic, constantly being revised by the processes which use the data. In this report one data store is named Information Base. Its database entries are composed of doctrinal information, regulations, or standard operating procedures (SOPs).

3.3.5 Known Data.

This is data which is commonly understood, and further definition would be redundant or unnecessary.

All data elements have been placed in one of the above 5 categories, and all elements which make up that item are listed in the definition (unless, of course, it is Known Data). These elements are: components, aliases, or related data. Each of these elements is defined in the same manner as all other entries in the Data Dictionary.

The figure below is an actual page from the Data Dictionary which defines data elements used in this report.

The Data Dictionary for this project can be found at Volume IV of this report.

NAME	DATA TYPE	COMPONENTS	ALIASES	RELATED DATA	REMARKS
Dir-Formatted-for-Tmsn	data structure	Dir-Encoded-for-Trans Enc-Dir-Sec-CI-Affixed Enc-Dir-Sec-CI-Aff-Prec-Asord Enc-Dir-SCI-DTG-Aff-Prec-Asord			Directives Formatted for Transmission. Directives which have been placed in a format which facilitates their transmission over a communications means.
Dir-RedTm-Nuc-Emp-Copt	data structure	Dir-Dev-Ah-NWops-Spt-COA			Directive to Redetermine the Nuclear Employment Concept. A commander's direction to his staff to develop an unacceptable nuclear employment concept recommendation.
Dir-Routed-for-Trans	alias: main name--Dir-Rtd-for-Tmsn				Directives Routed for Transmission.
Dir-Rtd-for-Tmsn	data structure	TBD	Dir-Routed-for-Trans	None	Directives Routed for Transmission. Directives that have been addressed for transmission to a particular recipient.
Directives	data structure	NWops-Emp-IP-Commo-Elec-Anx Orders-Plans			Directives. Verbal or written orders, plans, and letters of instruction.
Disadv-Assoc-Emp-NW-Ea-COA	data structure	TBD	None	None	Disadvantages Associated with the Employment of Nuclear Weapons in Each Course of Action (COA). Factors that are considered drawbacks to use of a nuclear weapon to support

Figure 11. Data Dictionary.

SECTION 4

MISSION THREADS

4.1 GENERAL.

The Functional Description (Volume II) and Data Flow Diagrams (Volume III) provided with this report do not portray any sequence of process performance. Many of the nuclear employment planning functions are performed in a sequence which parallels, and which is integrated with, the sequence of functions of the command and staff estimate process. As with the planning functions of the command and staff estimate process, nuclear employment planning functions are performed and sequenced depending upon the phase of planning in which the command echelon is engaged and in accordance with the dictates of the battlefield situation. Some functions, such as those which are part of the estimate of the situation, may be performed continuously.

US Army doctrine describes four phases of nuclear employment planning. We have termed the sequencing of nuclear employment processes within each phase as a mission thread. A Mission Thread Diagram has therefore been developed for each of the four phases of nuclear employment planning described below.

4.2 PHASES OF NUCLEAR EMPLOYMENT PLANNING.

US Army Field Manuals 100-30 (Nuclear Operations in Support of Airland Battle) and 6-20-30 (Tactics, Techniques, And Procedures For Fire Support For Corps And Division Operations) describe four phases of nuclear employment planning: peacetime contingency planning, transition to war planning, battlefield focus and refinement, and refinements to approved packages.

4.2.1 Peacetime Contingency Planning.

Peacetime (or pre-wartime) planning is that which is performed prior to a conflict. This planning is based on a given area of operations, an anticipated tactical situation, an expected threat, known limiting requirements and nuclear weapons resources, and other requirements as stated in a contingency plan.

4.2.2 Transition To War Planning.

Transition to war planning (planning that transitions from peacetime to wartime) entails the update of nuclear plans and weapons packages. It is based on information updates which apply to the forthcoming combat situation and which supplement peacetime planning already accomplished. Updates will add refinements to the intelligence preparation of the battlefield, nuclear weapons limiting requirements, and enemy activities.

4.2.3 Battlefield Focus And Refinement.

Battlefield focus and refinement is a further development and refinement of those nuclear weapons packages which specifically apply to a current tactical situation. The tactical situation may dictate the development of new packages to meet new contingencies. Both new and updated packages are developed based on updated guidance and are forwarded to higher headquarters for approval and integration.

4.2.4 Refinements To Approved Packages.

Approved package refinements are made to previously approved nuclear weapons packages under conditions in which nuclear weapons release has occurred. Refinements are made prior to receiving authority to execute weapons packages, and they entail confirming locations, processing sensor information, confirming fire units, coordinating aimpoints with conventional fire support and maneuver actions, and adjusting aimpoints. The actual execution of a nuclear strike and follow-on activities can be considered as part of this phase.

4.3 MISSION THREAD DIAGRAMS.

4.3.1 Explanation.

Mission Thread Diagrams for each of the four phases of nuclear employment planning are included at the end of this section. While specifically directed at corps, the process sequences described apply to division-level nuclear employment planning as well.

The highest possible level processes are shown. This means that if all of the subordinate processes of a given function are performed at a particular point, the highest-level function will be the only one shown. For example, if the fourth-level process, DETERMINE TRIGGER EVENTS (3.2.2.3.) is shown, then the performance of both of the subordinate functions, IDENTIFY GENERAL EVENTS (3.2.2.3.1.) and IDENTIFY SPECIFIC DECISION POINTS (3.2.2.3.2.), is implied.

In the interests of clarity, the processes associated with the receipt, maintenance, and transmission of information have not been included in the Mission Thread Diagrams.

4.3.2 Planning Phase Situations.

The following are brief descriptions intended to introduce each mission thread by specifying the corps situation for the four phases of nuclear employment planning.

- Peacetime Planning Situation. The headquarters of a CONUS-based corps has received a contingency operation plan (OPLAN) from the headquarters of an echelon above corps (EAC). In addition to other required planning information the operation plan provides the corps with a mission, an area of operations, nuclear resources available for planning, and nuclear employment limitations. Currently there are no hostilities in the contingency area. The corps headquarters must develop an operation plan for the corps. Refer to Page 20 for the sequence of nuclear employment planning functions.

- Transition To War Planning Situation. Hostilities have begun in the corps overseas contingency area. The corps headquarters has received an EAC order directing the corps to implement the EAC OPLAN and deploy overseas to conduct combat operations. The EAC order gives the latest enemy activities and order of battle and updates nuclear employment resources and limitations stated in the EAC OPLAN. On the basis of the EAC order the corps headquarters updates the planning done for the corps OPLAN and produces an operations order. Refer to Page 21 for the sequence of nuclear employment planning functions.

- Battlefield Focus And Refinement Situation. The corps has deployed overseas and is engaged with enemy forces. Nuclear weapons have not yet been used by either side. Looking out 72-96 hours, the corps commander and staff have determined the potential need to employ nuclear weapons. Refer to Page 22 for the sequence of nuclear employment planning functions.

- Package Refinement Planning Situation. The current battlefield situation confirms the need for nuclear weapons. Enemy activity indicates the approach of nuclear target decision points. The EAC headquarters has given the corps authorization to execute a previously approved nuclear weapons package. Refer to Page 23 for the sequence of nuclear employment planning functions.

CORPS MISSION THREAD

Peacetime Nuclear Employment Planning

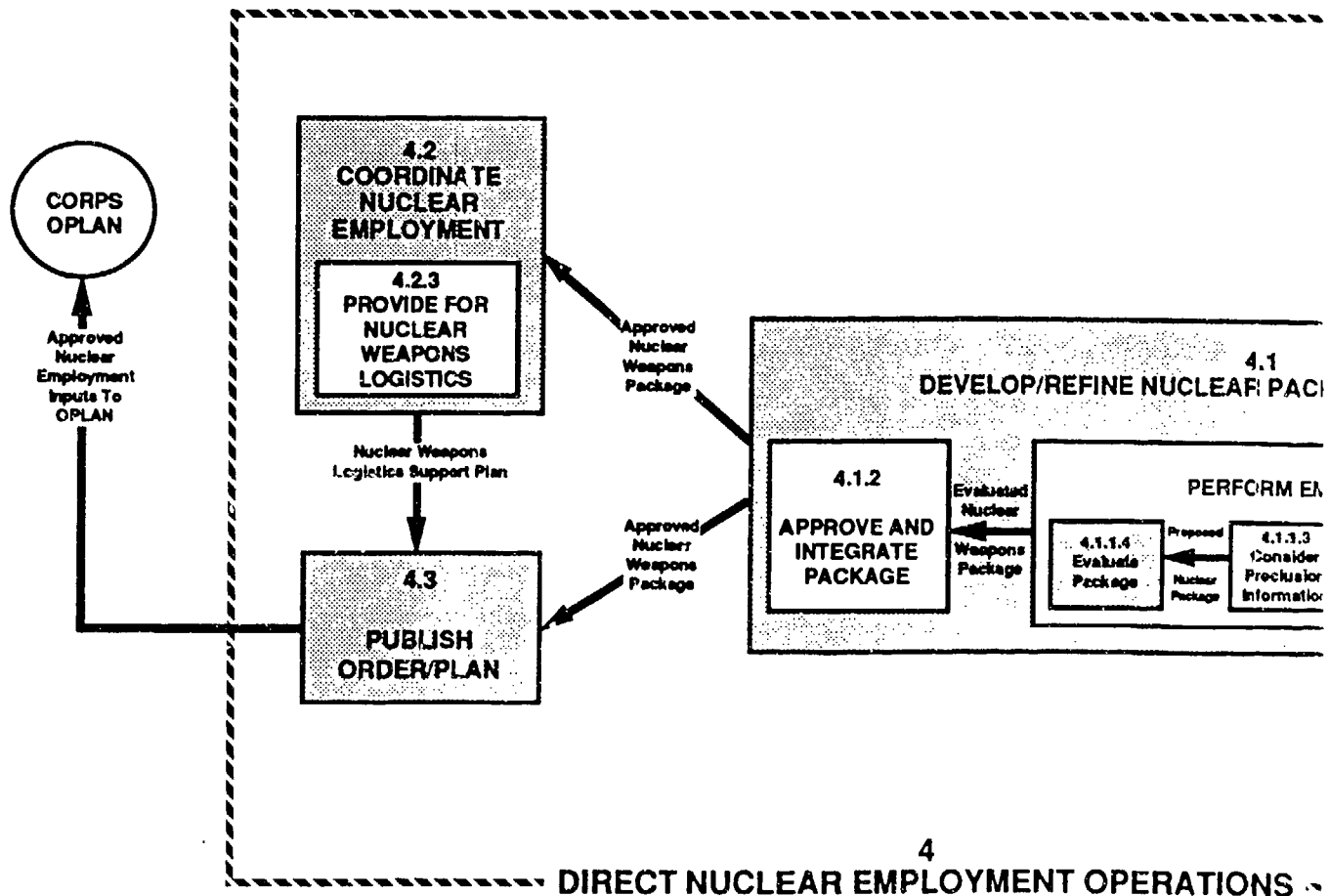
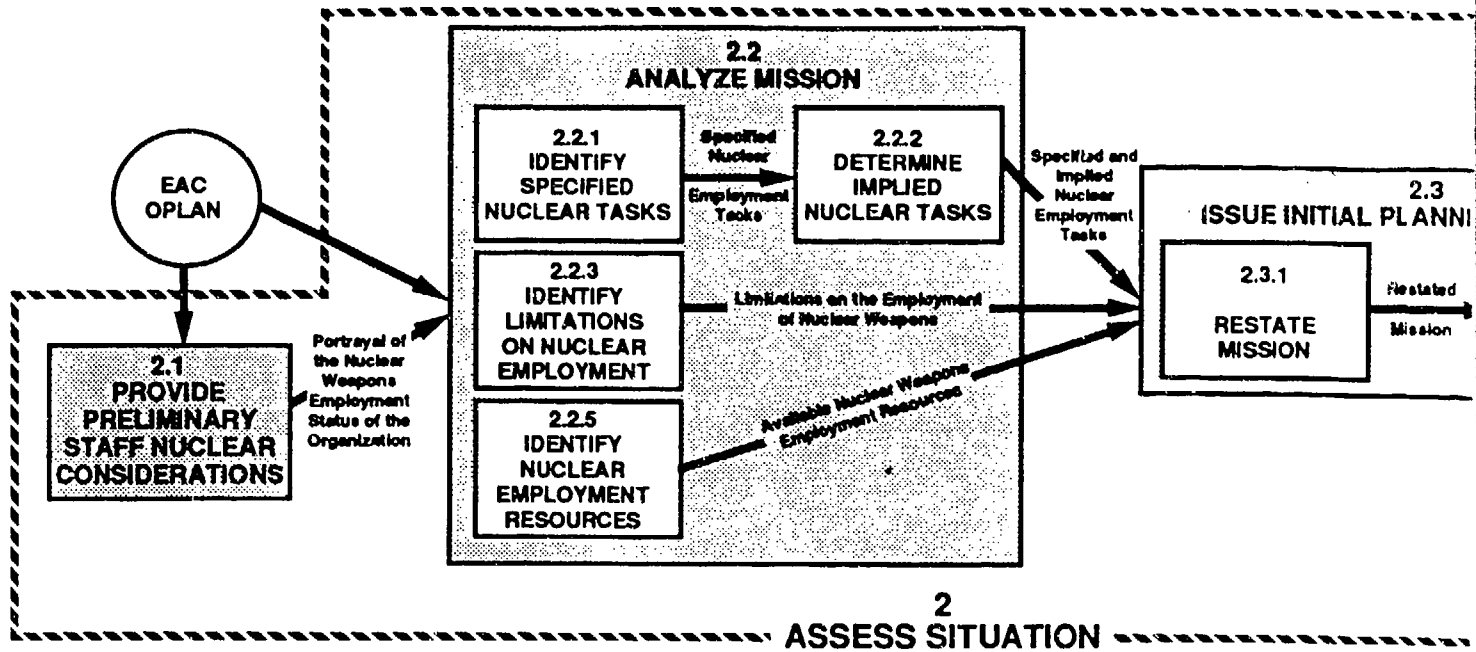
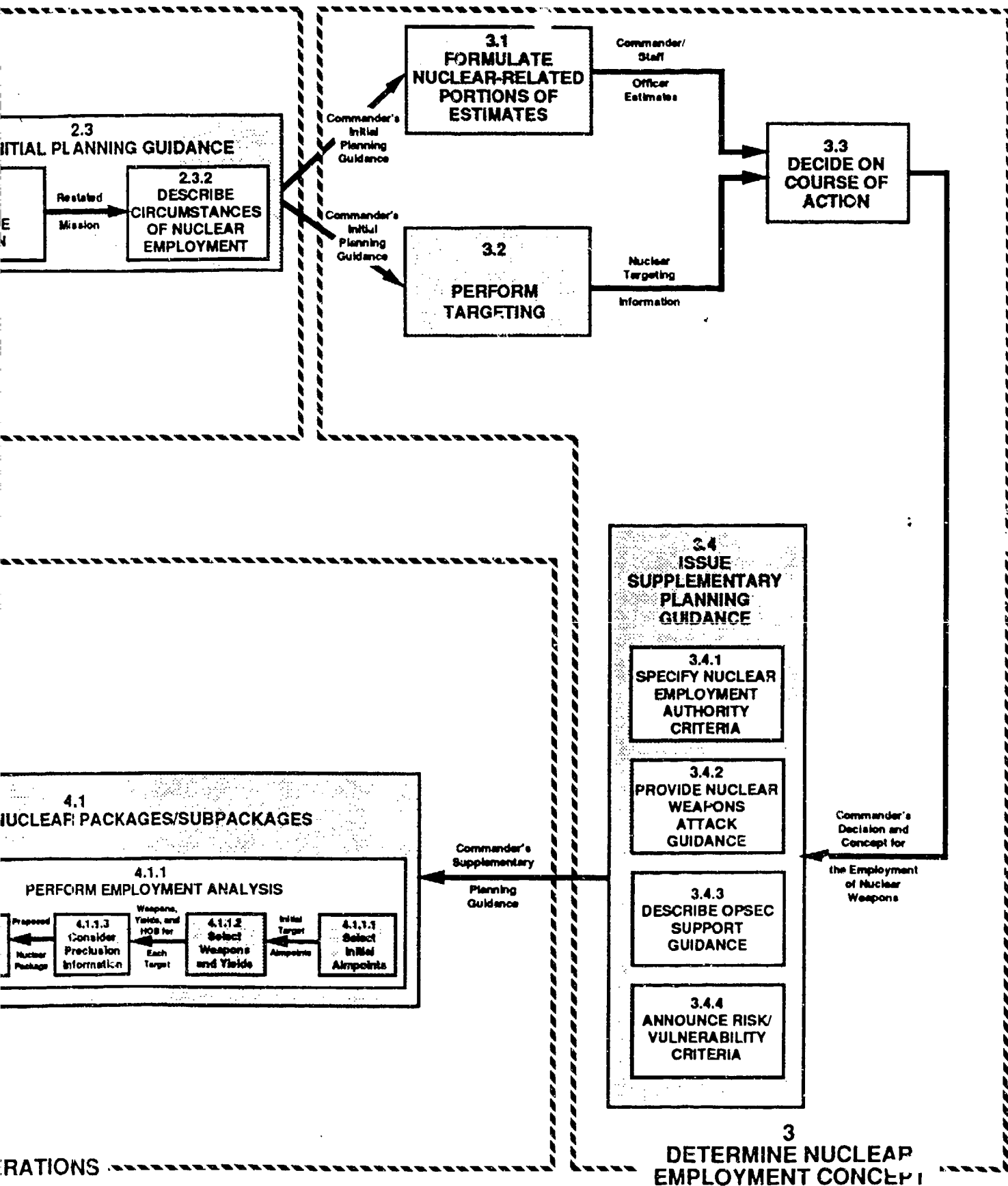


Figure 12. Peacetime nuclear emp



nuclear employment planning.

CORPS MISSION THREAD

Transition To War Nuclear Employment Planning

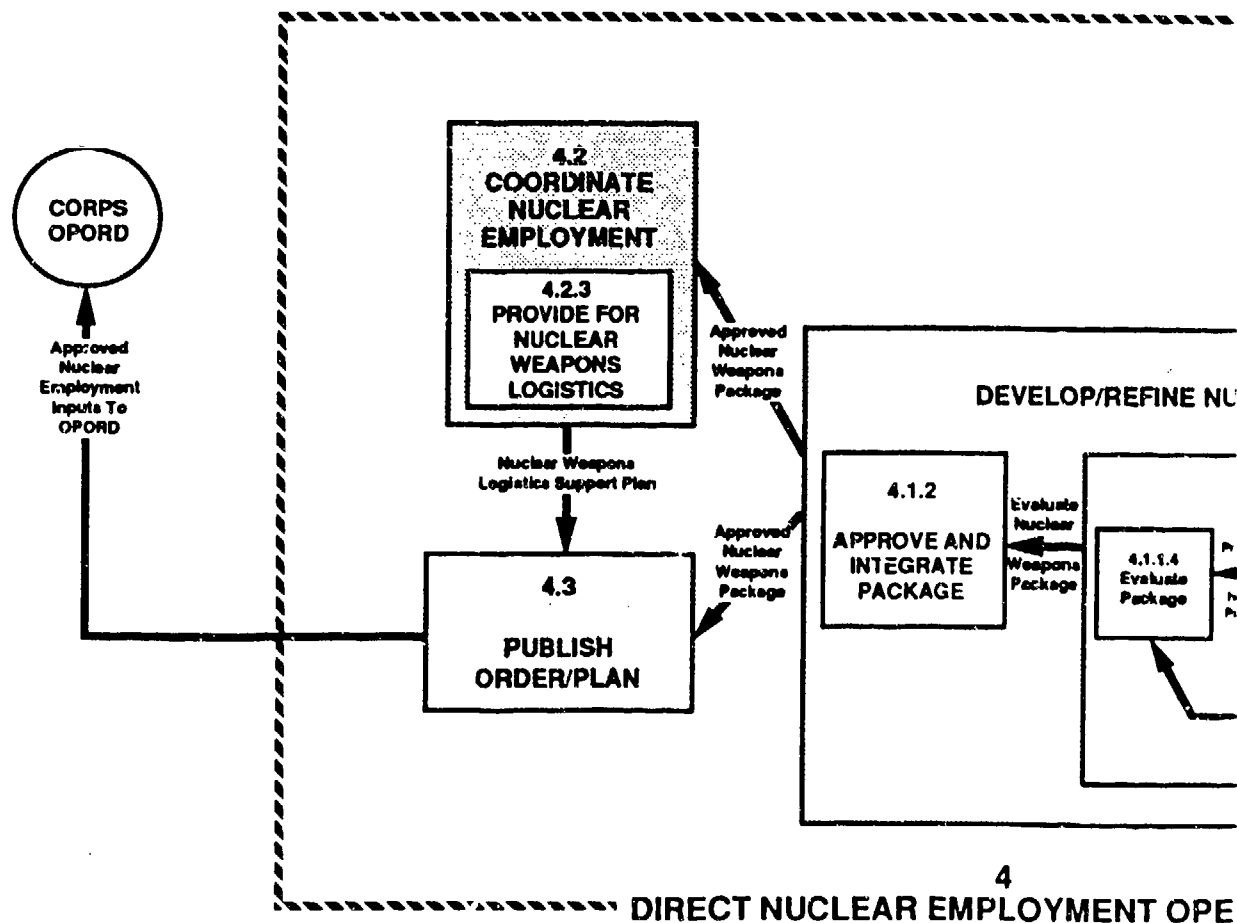
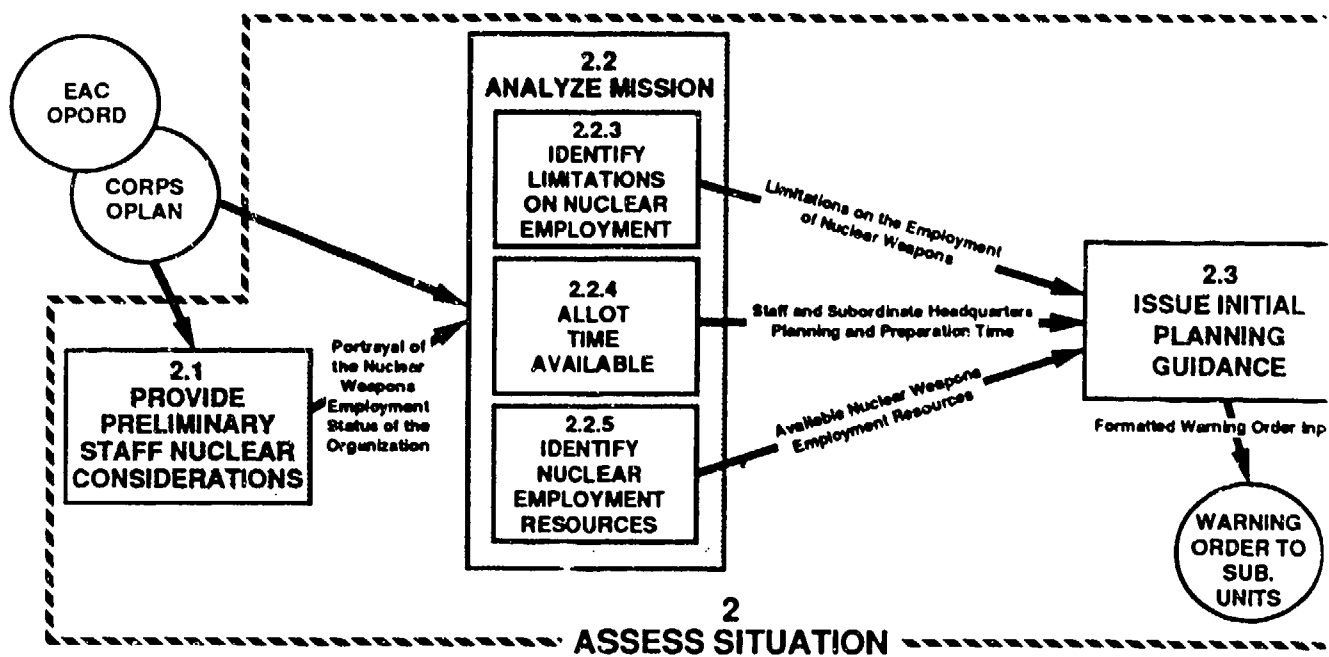
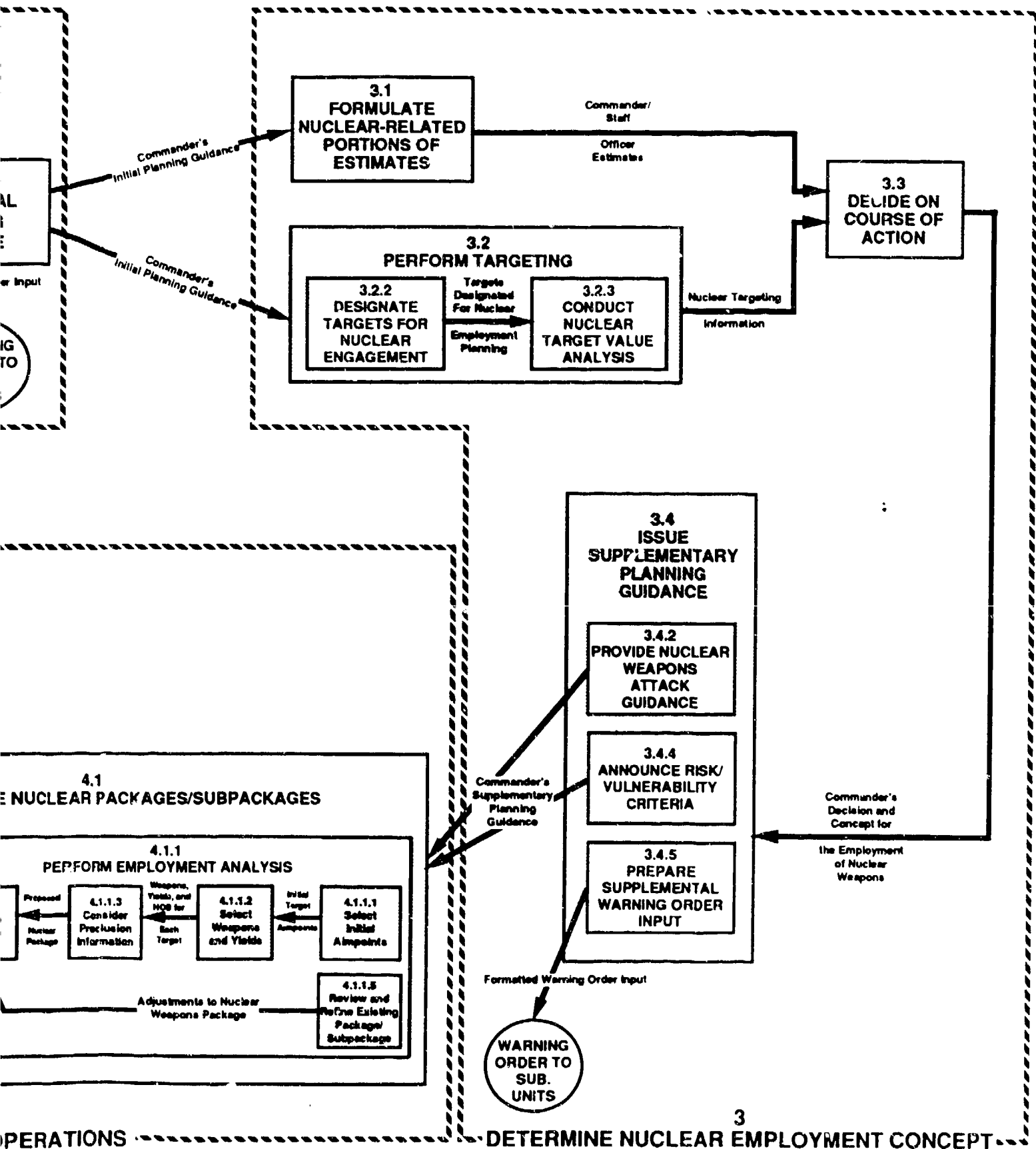


Figure 13. Transition to war



CORPS MISSION THREAD

Battlefield Focus and Refinement Planning

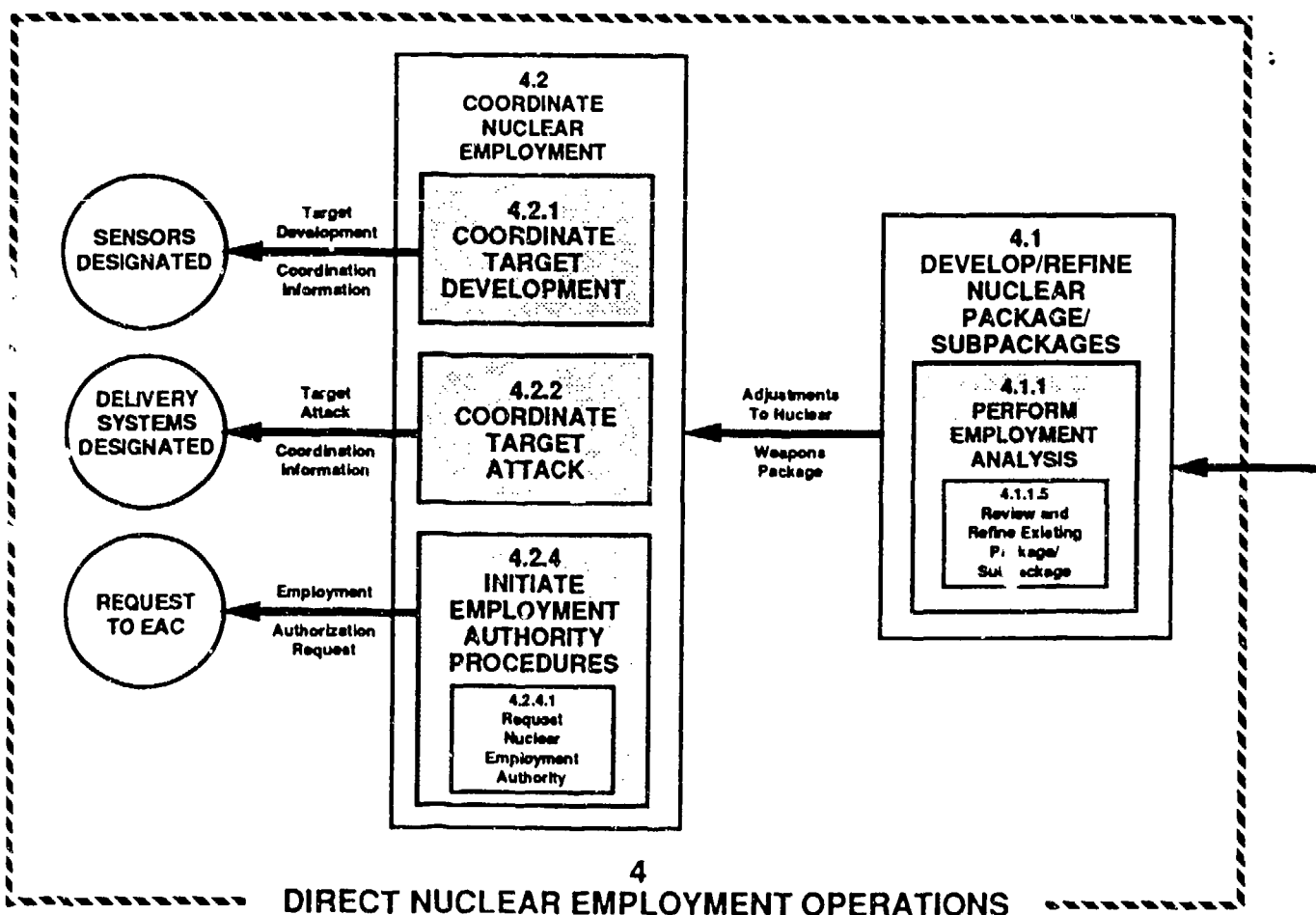
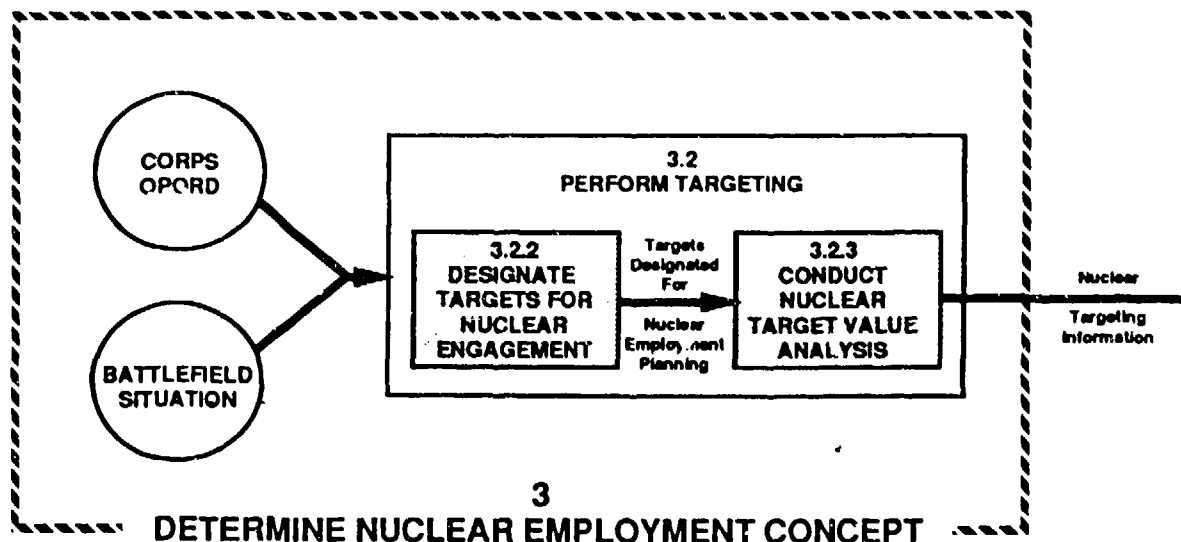


Figure 14. Battlefield focus and refinement planning.

CORPS MISSION THREAD

Package Refinement

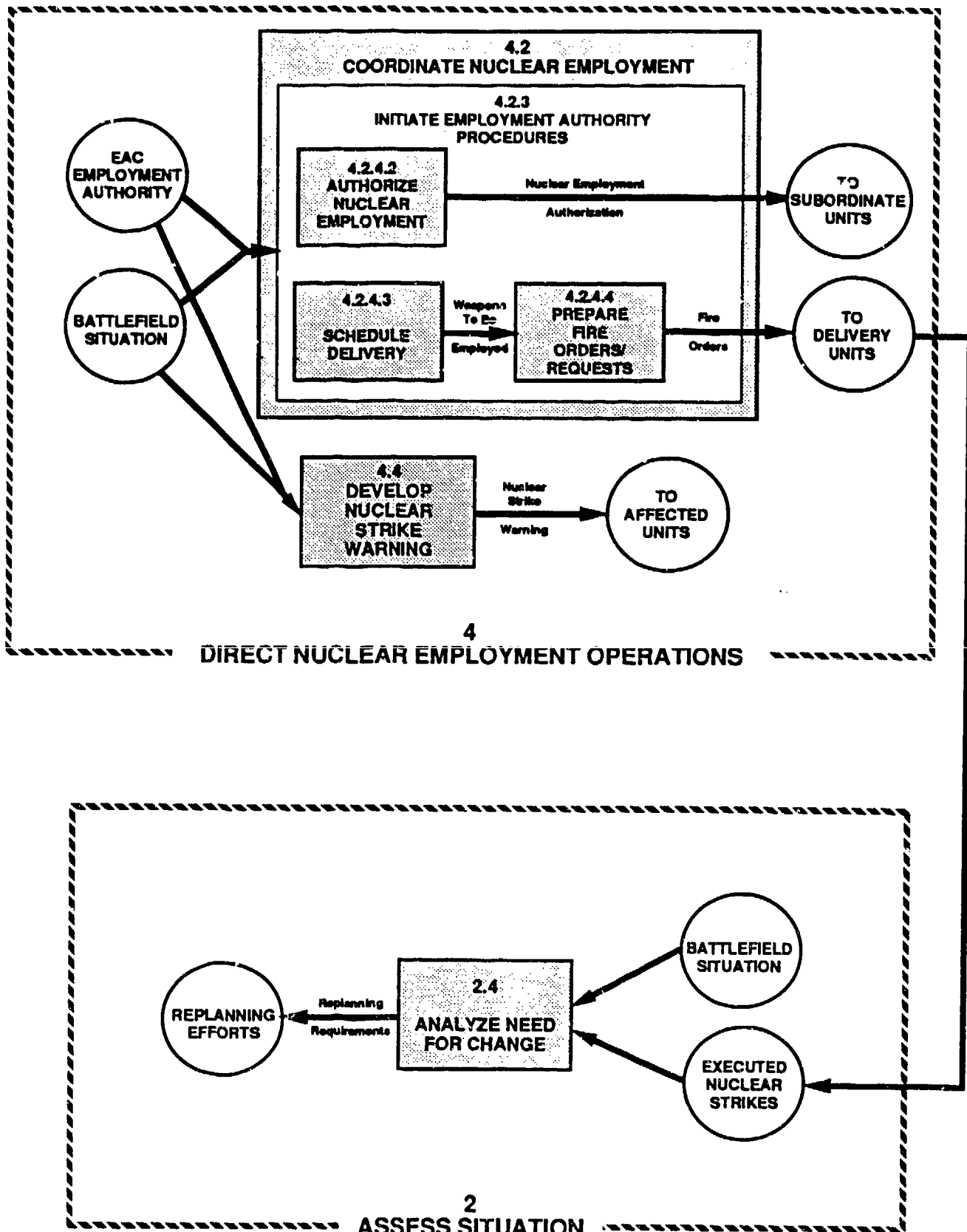


Figure 15. Nuclear package refinement.

SECTION 5

COMMANDER'S GUIDANCE IN NUCLEAR EMPLOYMENT PLANNING

5.1 INTRODUCTION.

5.1.1 FM 100-5, Operations.

FM 100-5, Operations, sets the stage for development and issuance of commander's guidance in AirLand Battle operations with this statement:

"Common to all operations--close, deep, and rear--is the necessity for superior command and control. The command and control system which supports the execution of AirLand Battle doctrine must facilitate freedom to operate, delegation of authority, and leadership from any critical point on the battlefield.

- Plans are the initial basis of action, but commanders must expect considerable variation from plans in the course of combat.
- Commanders should restrict the operations of their subordinates as little as possible. Mission orders that specify 'what' must be done without prescribing 'how' it must be done should be used in most cases."

5.1.2 Command Guidance.

Command guidance to initiate staff planning for the employment of nuclear weapons is essential. For initial planning, commanders should provide as much information about employing nuclear weapons as about employing maneuver forces and conventional fires. Command guidance normally consists of items such as those found in FM 101-31-1, Nuclear Weapons Employment Doctrine and Procedures:

- A statement of desired results.
- Tactical circumstances or decision points for initiating a release.
- The concept for the subsequent use of weapons if the initial effort does not accomplish the desired results.
 - Defeat criteria for enemy forces or damage objectives for fixed installations.
 - Delivery systems, weapons, and yields available for the planner.
 - The level of acceptable risk to friendly troops and noncombatants.
 - Restrictions on fallout from surface or subsurface bursts.
 - Criteria for avoiding collateral damage.
 - Criteria for intelligence collection, target priorities, and poststrike analysis.

5.1.3 Additional Command Guidance.

Additionally, other items of command guidance may be established for command and control, intelligence collection, and logistics operations in order to ensure timely and efficient nuclear employment planning.

5.2 TYPES OF GUIDANCE--DOCTRINE, SOP, OPLAN/OPORD, AND SPECIFIC SITUATION.

5.2.1 Doctrine.

An Army's fundamental doctrine is the condensed expression of its approach to fighting campaigns, major operations, battles, and engagements. Tactics, techniques, procedures, organizations, support structure, equipment, and training must all derive from it. To be useful, doctrine must be uniformly known and understood. (From FM 100-5)

5.2.1.1 Support Doctrine. All combat, combat support, and combat service support doctrine are derived directly from, and must support, the four fundamental tenets of AirLand Battle; i.e., agility, initiative, depth, and synchronization.

5.2.1.2 Doctrinal Baseline. A doctrinal baseline is the essential foundation for the operations of an army. However, few armies expect their doctrine to address every situation. The unit's mission, the enemy, the local terrain and weather, the forces under the control or in support of the commander, and the time available to the commander, all combine to dictate how doctrine will be executed in a given situation. Because of this, commanders develop more specific, standard guidance about the way they want their units to operate. This more detailed set of guidance forms the unit's Standing Operating Procedures.

5.2.2 Standing Operating Procedures (SOPs).

SOPs are based on applicable portions of published procedures from higher headquarters, the desires of the commander, and procedures that have been developed through experience. An SOP lists procedures that are unique to the organization and is used habitually for accomplishing routine or recurring actions or matters. An SOP facilitates and expedites operations by:

- Reducing the number, frequency, and length of other types of orders.
- Simplifying the preparation and transmission of other orders.
- Simplifying training.
- Promoting understanding and teamwork among the commander, staff, and the troops.
- Advising new arrivals or newly-attached units of procedures followed in the organization.
- Reducing confusion and errors.

5.2.2.1 Concept. SOPs are based on three key concepts: 1) they reflect local conditions; 2) they reflect the individual commander's attitudes and styles; and 3) they contain varying levels of detail within their parts.

5.2.2.2 Function. While doctrine has broad, global application, an SOP is written to change, modify, or amplify doctrine to reflect conditions in a particular geographic area. For example, at the theater level, units in Germany do not operate the same as units in Korea, Alaska, or Panama. The local weather, terrain, and lines of communication will change the requirements of the unit SOP. Also, SOP lets the

commander shape his unit's operations to reflect his personal style. To do this, the SOP must be a living body of knowledge, well known to the unit's soldiers, which reflects the commander's desires at a specific time.

5.2.2.3 Level of Detail. SOPs exist at every level of command. Their level of detail depends on what is to be accomplished. For example, an SOP written for a division headquarters will normally be relatively detailed in the guidance that addresses operations of the division staff. However, the part of the SOP that applies to subordinate commands will be much broader, covering standards and criteria common to all.

5.2.2.4 Degree of Flexibility. The degree of flexibility available through unit SOPs is not enough to address every operation or mission which a unit will encounter. It is worth noting that in the case of nuclear-capable units, while SOPs are developed and used in the general manner discussed here, the commander does not have quite as much flexibility as in nonnuclear-capable units because of both legal and political restraints as well as the technical procedures that limit the manner in which nuclear weapons must be emplaced and employed for correct use.

5.2.3 OPLAN/OPORD.

Both doctrine and SOP provide basic guidelines for general operations, such as the defense, the attack, and movements to contact. However, neither contains details of the current situation, plans, and operations.

5.2.3.1 Tactical Operations. Tactical operations are the conduct of battles and engagements within the context of campaigns and major operations. They are the domain of corps and smaller units. Tactical planning centers on preparation for battles and engagements. It begins with the assignment of a mission, or with the commander's recognition of a requirement.

5.2.3.2 OPLAN. The OPLAN then, contains detailed information and guidance about a specific operation. Like doctrine and SOP, the OPLAN is designed to tell soldiers in the unit what to do in a specific situation. Since doctrine and SOP are already known, the OPLAN does not list elements of either doctrine or SOP unless there is a clear need to reconfirm them. It is unrealistic to expect all OPLAN assumptions to be correct. For this reason, the commander must allow his staff and subordinates certain latitude in the execution of the OPORD.

5.2.4 Situation Specific Instructions.

Commanders expect their staffs and subordinates to recognize deviations from the original planning assumptions and to take the initiative to accommodate them. These actions may include the entry of more specific guidance, recommendations to modify existing guidance, or case-by-case overrides of established SOP or OPLAN guidance.

5.3 AN OVERVIEW OF COMMANDER'S GUIDANCE--SPECIFIED AND IMPLIED BY DOCTRINE.

5.3.1 Specific Commander's Guidance.

One way of viewing the increasing complexity of commander's guidance is as shown in Figure 16. This figure shows guidance beginning with the broad doctrinal application and progressing to the very detailed application of situation specific items of guidance. At each increasingly detailed level, the guidance that existed at the previous level is not destroyed, it is simply added to, or overlaid, with the added information.

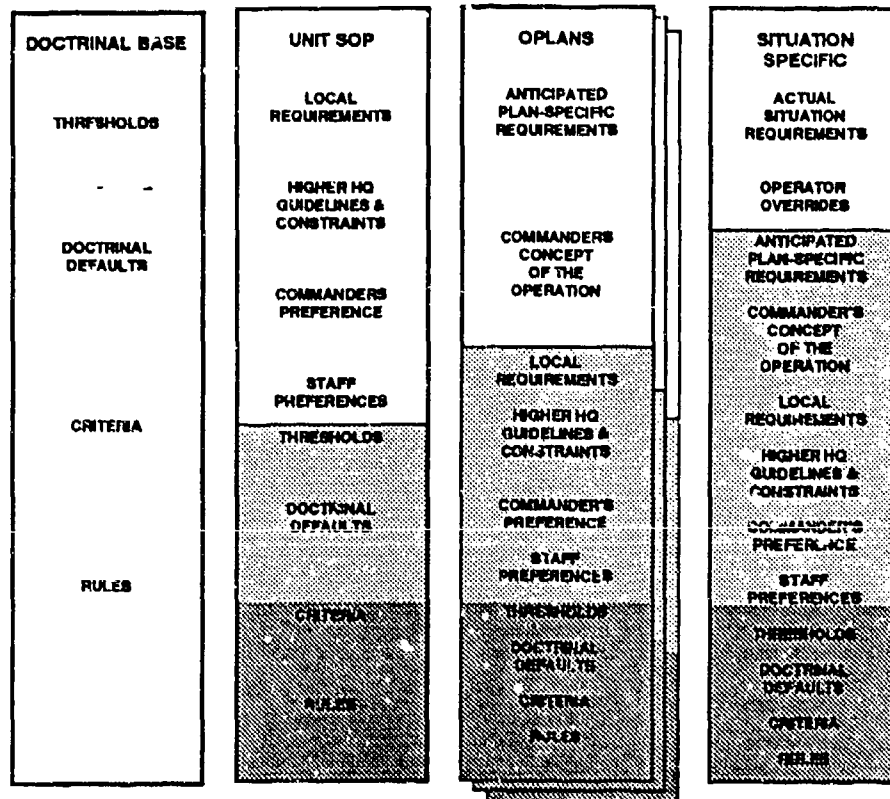


Figure 16. Commander's guidance overview.

5.3.2 Examples of Nuclear Employment Planning From Doctrine.

Following are several examples of guidance gleaned from doctrinal references concerning nuclear employment planning. Considering the wording of these statements of doctrinal guidance, some are very specific while others are not. Those statements that are not specific; i.e., that imply guidance; lay the foundation for the development of unit SOPs, OPLANS/OPORDs, and situation specific guidance.

5.3.2.1 From AR 50-5, Nuclear Surety.

Specified:

- Jettisoning of nuclear weapons from US Army aircraft during movement is not authorized.

- Single engine fixed wing aircraft will not be used for movement of nuclear weapons under instrument flight rules (IFR) conditions.
- Nuclear weapons will be moved by external helicopter transport only when loss of US control is imminent and time does not permit preparation and movement by internal transport.
- Before loading, all load-carrying aircraft and vehicles will be searched and inspected for unauthorized personnel or equipment and possible sabotage.
- An exclusion area, to which entry is controlled, will be established around the nuclear weapon carrier any time it is stopped.
- All nuclear weapons will be guarded continuously by at least two qualified armed individuals.

Implied:

- (During logistical movement) Rules of engagement will be prescribed by the commander responsible for the movement and subject to approval of the major command. Personnel accompanying the movement will be briefed on the rules of engagement before departure.
- There will be formal, written procedures for close control of all information on planned and actual movement of nuclear weapons off military reservations. (i.e., initial deployment to field locations.)

5.3.2.2 From FM 6-20 (1984). Fire Support in Combined Arms Operations.

Specified:

- Three types of restriction that are entered into the division artillery computer (TACFIRE) by the FSE personnel: relative time, target priorities, and preinitiation.

Implied:

- By this FM, the commander is directed to provide nuclear planning guidance on the following topics when the use of nuclear weapons is anticipated: 1) specific results desired from the use of nuclear weapons for the tactical contingency identified by division; 2) establishment of target priorities based on the tactical situation; 3) identification of additional constraints on the use of nuclear weapons to minimize the effect on the scheme of maneuver, such as preventing the creation of obstacles.
- Minimum safe distances for friendly troop safety and safety distances for aircraft in flight must receive close attention.
- Normally, nuclear fire planning is performed at the main fire support element. However, the tactical FSE and division artillery S3 must be prepared to assume this function if the main FSE is destroyed.

5.3.2.3 From FM 9-84. Special Ammunition (Nuclear) Direct and General Support Unit Operations.

Specified:

- The unit will publish nuclear ammunition load plans that show the number of items, type of items, storage location of the items, and material needed for loading and tying down the load in each vehicle.
- The unit will publish lists indicating specific personnel and equipment to be moved to each nuclear ammunition supply point, warhead holding area, or both.
- The nuclear ammunition supply point should be located near supported units in order to provide responsive support.
- Roads into and out of the nuclear ammunition supply point should be passable under all weather conditions.
- Nuclear ammunition is moved only after a route and new position reconnaissance has been performed.
- The ordnance unit storing and maintaining nuclear weapons maintains accountability and only transfers custody to the using unit.

Implied:

- The actual location of stocks depends on: -present and anticipated missions; -weapons availability; -firing unit carrying capacity; -the lift, storage, and maintenance capability of nuclear ammunition companies; -dispersion; -types of munitions.

5.3.2.4 From FM 100-30. Tactical Nuclear Operations.

Specified:

- The FSCOORD schedules the weapons to be used.

Implied:

- Safety considerations limit the proximity of nuclear strikes near friendly forces and civilian populace. This limit can vary with: -the protective posture of friendly units; -the location of civilian populace; -the weapon yield; and/or the range to the target.
- Targeting criteria must be current and consistent with existing or expected release conditions.

5.3.2.5 From FM 100-50. Operations for Nuclear Capable Units.

Specified:

- Each unit will maintain a reaction force as an integral part of its defense plan.
- DD Form 1150 will be used for transfer of custody, certificate of expenditure, certificate of destruction, or transfer of reportable nuclear residue or components, to include PAL devices.

- Weapons carrying vehicles will meet the applicable preventive maintenance checks and services (PMCS) or equipment serviceability criteria (ESC).
- No maintenance or repairs that might increase the chance of fire will be performed on a vehicle or aircraft while a nuclear weapon is on-board.

Implied:

- Nuclear-capable units must coordinate with higher and adjacent units for additional security support.
- The commander responsible for movement will provide for additional security if he does not have sufficient resources of his own.

5.3.2.6 From FM 101-31-1, Nuclear Weapons Employment Doctrine and Procedures.

Specified:

- Minimum safe distance (MSD) protective measures (Figure 17).

DGZ	-	Evacuation of all personnel. If
MSD1		evacuation is not possible or if a
		commander elects a higher degree
		of risk, maximum protective
		measures are required.
MSD 1	-	Maximum protection. Personnel are in
MSD 2		buttoned-up tanks or crouched in
		foxholes with improvised overhead
		shielding.
MSD 2	-	Minimum protection. Personnel on
MSD 3		open ground lie prone and cover all
		skin areas with thermal protection at
		least equal to that of a two-layer
		summer uniform.
MSD 3	-	No protective measure except against
		dazzle beyond and EMP.

Figure 17. MSD protective measures.

Implied:

- Security and operational purposes may cause commanders to have more or fewer weapons on hand than are required when release authority is received. Established procedures must be in place for obtaining additional weapons or having another unit fire them.

5.3.2.7 From FM 101-31-3, Nuclear Weapons Employment Effects Data.

Specified:

- The fire mission to the unit, when calling for a W10 nuclear projectile, will specify the height of burst.
- The following scheduling priorities should be used, as the tactical situation permits, to reduce the probability of preinitiation: -fire the weapon subject to preinitiation first; -fire at the most distant targets first; -fire at the most downwind targets first.

Implied:

- Timing, desired ground zeros, and flight paths must be taken into consideration if more than one nuclear weapon is to be employed in the same approximate location at the same approximate time.
- Nuclear burst in the vicinity of the battery position may cause preinitiation.

5.3.2.8 From TC 6-50-2, Field Artillery Cannon Unit Nuclear Operations.

Specified:

- Nuclear weapons will not be assembled until a permissive action link (PAL) unlock message is received through the emergency action program (EAP).
- Do not identify prescribed nuclear load (PNL) carriers by special flags or signs.

Implied:

- If possible, initial deployment of the PNL should have priority for air assets.
- The security objective during deployment is to reduce the signature and vulnerability of the PNL as it is being removed from the peacetime security environment.
- The PNL is usually maintained outside the covering force area although usually a large percentage of both divisional and nondivisional artillery participates in this phase of the battle.
- As the fight moves into the MBA, covering force nuclear-capable field artillery battalions linkup with and assume control of their PNL.
- Field exercises and SOPs should identify and exercise procedures for reconstitution of command and control.
- Each headquarters must be constantly aware of the nuclear capability/status of subordinate units.

5.4 COMMANDER'S GUIDANCE IN NUCLEAR EMPLOYMENT PLANNING.

5.4.1 Nonspecific Commander's Guidance.

With respect to Nuclear Employment Planning, commander's guidance may be established which is system nonspecific, applying to all nuclear-capable systems which apply to a type of fire support. For example, the commander may establish system nonspecific targeting procedures guidance which applies to artillery. Commander's guidance may also be established which is system specific. For example, movement and positioning guidance may be established specifically for 155mm howitzers. Guidance that is established at the system nonspecific level may be further detailed at the system specific level.

5.4.2 Establishing Guidance.

Guidance may be established at any echelon and passed to subordinates. However, guidance established at a higher echelon may not be made less restrictive or overridden at a lower level without the permission of the establishing headquarters.

5.4.3 Items Of Guidance.

Items of commander's guidance directly applicable to this Phase II effort are listed and detailed in the paragraphs that follow. There is no requirement for a commander to use any or all of the guidance items that follow; they are included here as potential items of guidance which a commander might desire to establish. The items that follow are also not all-inclusive. All of the guidance items that follow have their basis in doctrine.

- One of the entries that appears for each item of guidance is "Doctrinal Default." If an 'instruction' or 'value' appears in the sources used for this report (i.e., those listed throughout subparagraph 5.3.2), it is included at this entry. If not, a doctrinal default is not listed, and the default is considered to be dependent upon the known or anticipated situation at the time of planning.

- Another entry that appears under each item of guidance is "Other Guidance Affected." This refers to the items of guidance identified in this report.

5.5 SYSTEM NONSPECIFIC GUIDANCE.

For this effort, system nonspecific guidance is established for artillery and/or for air nuclear-capable systems and their associated command and control, targeting, and combat service support systems. Naval gunfire is not included.

5.5.1 Nuclear-Capable Attack Systems Guidance.

Guidance under this heading includes items established for artillery and air fire support nuclear-capable attack systems. System nonspecific attack guidance for nuclear weapons will typically be established at the corps, but may be established at the division as well.

5.5.1.1 Conditional Employment Guidance.

Purpose: Allows the commander to direct or restrict the use of one or more types of nuclear-capable attack systems by period of time, in specific areas, against specific target types/subtypes, or a combination of these.

Rationale: A commander may desire to set restrictions in order to reserve the use of nuclear-capable assets for upcoming operations and/or to achieve his desired mix of nuclear and conventional attack assets in a given mission. He may set this guidance to provide for safety of troops that are passing through an area in a specified period of time. He may direct the use of certain nuclear-capable attack assets in an area or at a given time for the same reasons. He may direct specific nuclear-capable attack assets against specific targets because his experience factor assures him they are best capable of achieving his battle goals. A commander may desire to change the guidance set here as the plan or battlefield situation dictates.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Attack Systems: Air, FA.
- Condition: Directed, Restricted.
- Time: Inclusive date-time group for which the condition exists.
- Area: Description of the area in which the condition exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- Target Type/Subtype: The list of target types/subtypes against which the condition exists.
- Source: Unit ID. This identifies the commander who directed or restricted the nuclear-capable attack system. It tells other operators from which commander to request permission if they wish to override the guidance.

Other Guidance Affected:

- Priority of System Selection Guidance. Care must be taken that conflicting guidance is not set between these two items of guidance.
- Excluded Target Attack Guidance. Specific fire support systems may be directed or restricted against certain target types/subtypes in Conditional Employment Guidance. Excluded Target Attack Guidance should be checked to ensure that the same target types/subtypes have not been excluded for that particular fire support system (and/or at that particular time, and/or in that particular area, etc.), thus causing a conflict.
- Nuclear Package Composition Guidance. Directing or restricting nuclear-capable attack systems under Conditional Employment

Guidance may conflict with guidance set under Nuclear Package Composition Guidance, causing inadequate coverage of the target area or less-than-desired effects on targets.

5.5.1.2 Priority of System Selection Guidance.

Purpose: Serves as a tie-breaker when more than one nuclear-capable attack system is available and capable of attacking a specific target.

Rationale: A commander may set this guidance after he has performed an analysis of his nuclear-capable and conventional attack assets so that he effectively covers the targets in his area while conservatively using his nuclear-capable attack assets. The "rule of thumb" in nuclear employment is to use the fewest number of the smallest attack system firing nuclear weapons of the smallest yield that will accomplish the effects desired in the target area.

Doctrinal Defaults: FA = 1; Air = 2.

Types of Entries:

- Fire Support System: Air, FA.
- Priority: 1, 2. (the number of priorities that can be established will match the number of entries of fire support systems.)
 - Time: Inclusive date-time group for which the priority exists.
 - Area: Description of the area in which the priority exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.

Other Guidance Affected:

- Conditional Employment Guidance. Care must be taken that conflicting guidance is not set between these two items of guidance.

5.5.1.3 Target Eligibility Cutoff Guidance.

Purpose: Specifies the minimum priority value that a target must have to be attacked by a particular type of nuclear-capable attack system.

Rationale: A commander may desire to set minimum target priority values for attack by specific types of nuclear-capable fire support assets to achieve maximum coverage of the target area while following the "rule of thumb" stated earlier. However, targets of immediate importance may not always have a high priority attached to them. In these situations, the commander may use an override of the established guidance value.

Doctrinal Default: There is no doctrinal default, however it is recommended that the values established be high so that targets which

can be covered by conventional assets are not routinely considered for nuclear attack. For example, the following priorities might be established: Air = 1100; FA = 1000.

Types of Entries:

- Fire Support System: Air, FA.
- Target Priority: A number, 0-1144.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.1.4 Target Defeat Criteria, General Guidance.

Purpose: Allows the commander to specify the percentage of effects he wants to occur on the target or in the target area. Nuclear targets are considered to be either area targets or point targets. For area targets, it is important to determine the level of materiel and/or personnel damage desired (normally expressed as a fractional level), and the percentage of expected or high assurance coverage. Defeat criteria for area targets can be termed:

- Immediate permanent (IP) ineffectiveness.
- Immediate temporary (IT) ineffectiveness.
- Latent lethality (LL).

The type of defeat criteria depends upon the time between the burst and the engagement of the targeted enemy. For point targets, which are generally single-element materiel targets or occupy a small area in comparison to the damage radii, it is important to determine the desired level of damage and the probability of achieving this desired level of damage.

Rationale: After the commander performs his nuclear-capable attack asset analysis, checks the status of nuclear munitions, and reviews the OPLAN/OPORD, he may desire to set values in this guidance to ensure his fires support the OPLAN/OPORD while they do not use up his attack assets and munitions ineffectively and inefficiently.

Doctrinal Default: There is no doctrinal default. Situational.

Other Guidance Affected:

- Target Defeat Criteria, Specific Guidance. Care should be taken not to negate guidance established under Target Defeat Criteria, Specific for a particular target type/subtype.

5.5.1.5 Target Defeat Criteria. Specific Guidance.

Purpose: Allows the commander to specify the percentage of effects he wants to occur on a target by specific target types/subtypes.

Rationale: The commander may desire to set very specific target defeat criteria by individual target types/subtypes, as opposed to using the generic levels of defeat, to keep a 'close-hold' on the expenditure of nuclear-capable assets and munitions.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- **Target Type/Subtype:** List of target types/subtypes for which the commander wants to specify target defeat criteria.
- **Point or Area:** The target type/subtype should be categorized as either typically a point target or an area target.
- **Defeat Criteria:** This is represented as a fraction, for area targets, a number, 0.01-1.00. For point targets, it is a specified level of damage. In either case an expected probability of achieving the desired effects is stated.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.1.6 Nuclear Package/Subpackage Composition Guidance.

Purpose: Nuclear weapons packages and subpackages are discrete groupings of nuclear munitions by specific yields planned for employment. This guidance item allows the commander to direct or restrict the use of particular nuclear packages/subpackages in specific fire support systems by periods of time, in specific areas, against specific target types/subtypes, or a combination of these.

Rationale: Planning for nuclear packages/subpackages is based on assumptions about the strength and disposition of enemy forces, the mission(s) of friendly forces, the number of yields and the types of weapons available, and the status and disposition of friendly forces at the time the package/subpackage is expected to be employed. A commander may desire to restrict the use of certain packages/subpackages in a area at a specified period of time to assure safety of friendly troops passing through that area, or to conserve packages/subpackages for upcoming operations (as a change in battle focus).

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Package/Subpackage/System: XX/Air, XX/FA.
- Conditional: Directed, Restricted.
- Time: Inclusive date-time group for which the condition exists.
- Area: Description of the area in which the condition exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- Target Types/Subtypes: A list of any target types/subtypes for which the condition applies.

Other Guidance Affected:

- Conditional Employment Guidance. Directing or restricting nuclear packages/subpackages for weapon systems that have been restricted or directed for the same periods of time, in the same areas, against the same target types/subtypes, etc. is conflicting and may cause inadequate target coverage.

5.5.2 Command And Control (C2) Guidance For Nuclear Operations.

Guidance under this heading includes those items that assist a commander in commanding and controlling organic, assigned, and attached subordinate units as well as in providing C2 guidance for the nuclear fire planning process.

5.5.2.1 Fire Support Coordination Measures Guidance.

Purpose: Fire support coordination measures (FSCMs) provide for rapid coordination and safeguards to friendly troops, vessels, aircraft, and installations. Rules about 'why' or 'when' an FSCM might be established assists the FSCOORD and other planners in their nuclear employment planning tasks.

Rationale: Not all fire support coordination measures apply to nuclear weapons, but the establishment of fire support coordination measures, for both nuclear and conventional forces, aids in nuclear employment planning. FSCMs are normally recommended by the FSCOORD and implemented by the force commander.

Doctrinal Default: Boundaries, once established by an OPLAN/OPORD. Brief descriptions of the permissive and restrictive fire support coordination measures which may be established follow. Whether they apply to nuclear fires, conventional fires, or both is stated.

- Permissive:
 - Boundaries, allow the force commander to engage targets in his zone of action.

--Coordinated fire line (CFL), allows conventional fires in a portion of the maneuver commander's zone without coordination with the commander who established the line. Nuclear fires require coordination.

--Fire support coordination line (FSCL), facilitates the attack of targets by all fire support means, particularly tactical air force and nuclear weapons, in that portion of the establishing commander's zone beyond the line. No additional coordination is necessary provided the fires or their effects (except dazzle and fallout from an inadvertent surface burst) do not fall short of the FSCL.

--Free-fire area (FFA), a specific, designated area into which any fire support means, to include nuclear, may delivery fires without additional coordination between the force requesting/delivering fires and the establishing headquarters.

- **Restrictive:**

- Boundaries, require coordination with adjacent or higher headquarters to cross.

- Restrictive fire line (RFL), established between converging forces across which fires, to include nuclear fires, may not be delivered without coordination with the affected force.

- Restrictive fire area (RFA), an area in which specific restraints have been imposed and into which fires in excess of those restraints will not be delivered without coordination...

- No-fire area (NFA), a specific area into which no fire support means will deliver fires and into which no effects from fires will fall, unless coordinated on a case-by-case basis.

- Airspace Coordination Area (ACA), a three-dimensional block of friendly airspace which will remain free of friendly surface-delivered conventional and/or nuclear fires and their effects, and which will be reasonably safe for friendly aircraft to fly through.

Types of Entries:

- **Type of Fire Support Coordination Measure:** Restrictive, Permissive.

- **Name:** Boundaries, Coordinated Fire Line, Fire Support Coordination Line, Restrictive Fire Line, Restrictive Fire Area, No-Fire Area, Free-Fire Area, Airspace Coordination Area.

- **Area:** Description of the area covered by the fire support coordination measure. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.

- **Time:** Effective date-time group during which the fire support coordination measure being described exists.

- **Rules for Establishing:** Allows the commander to establish a set of rules for 'when' or 'why' to establish particular fire support coordination measures. (Rules TBD.)

- **Source:** Unit ID. This is the identification of the commander who established the fire support coordination measure(s). It tells other

operators from which commander to request permission if they wish to override the guidance.

Other Guidance Affected:

- Troop Safety Guidance. Fire support coordination measures are established to facilitate operational requirements. They should be compared to Troop Safety Guidance for possible conflicts.
- Collateral Damage Constraints Guidance. Fire support coordination measures are established to facilitate operational requirements. They should be compared to Collateral Damage Constraints Guidance for possible conflicts.

5.5.2.2 Guidance on Recognizing Conditions Causing Nuclear Employment.

Purpose: To establish decision points where the commander should be notified that nuclear employment may be required.

Rationale: Certain activities or events indicate a need for nuclear employment. Recognizing these situations allows for more effective planning in anticipation of a request for/approval of nuclear employment.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Enemy Identification/Description: Type of enemy unit, or description of enemy that includes number of people and equipment.
- Enemy Location: Description of the area where the enemy is located. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- Enemy Activity: Advancing, Withdrawing, Stationary, Fixed, or Other.
- Own Status Report: Personnel, Attack Systems, Command and Control Systems, Combat Service Support Systems, Munitions On-Hand.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.2.3 Guidance on the Preparation/Dissemination of STRIKEWARN Messages.

Purpose: Allows the commander to detail what units will receive the STRIKEWARN Messages and when; also over what communications means and modes these messages will be transmitted.

Rationale: Troops in areas of unacceptable risk from the effects of nuclear weapons should be warned to take appropriate protective

measures. However, warnings transmitted too early or in the clear may alert the enemy to a planned strike. Because of this, commanders may desire to establish guidance under this heading.

Doctrinal Default: As a minimum:

- Aircraft will receive advance warning during both day and night operations because they can move rapidly from areas of negligible risk to areas of unacceptable risk.
- Units warned will receive only those parts of the STRIKEWARN Message pertaining to them.
- If a strike is cancelled, units that received the STRIKEWARN Message will be notified of the cancellation.

Types of Entries:

- **Message:** STRIKEWARN, Notice of Cancellation.
- **Unit:** Unit ID. Identifies the unit(s) to receive the message.
- **Lines to Transmit:** Identifies the lines within the STRIKEWARN to be transmitted.
- **Means and Modes of Transmission:** Lists the means and modes of communication available, to include whether they are secure.
- **Priority for Using Means and Modes of Transmission:** A number, 1-n.
- **Time to Transmit:** Specifies the number of minutes the STRIKEWARN should be transmitted prior to the nuclear strike.
- **Source:** Unit ID. Identifies the commander who established the guidance. It tells other operators from which commander to request permission if they wish to override the guidance.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.3 Sensor Guidance For Nuclear Operations.

The sensor systems available for use in nuclear operations are those same sensor systems available for use in conventional operations. Key to optimizing sensor employment is the recognition of sensor capabilities, and the integration of battlefield intelligence to the sensor prioritization process.

5.5.3.1 Sensor Systems Conditional Employment Guidance.

Purpose: Allows the commander to direct or restrict a particular sensor system by period of time, in specific areas, against specific target types/subtypes, or a combination of these.

Rationale: After the commander has reviewed the OPLAN/OPORD and performed an analysis of his sensor assets, he may want to set this guidance to employ his sensors where they can most effectively detect

targets. He may restrict sensors in an area based on known or suspected enemy activity and on the known or suspected threat to sensor assets. He may direct sensor employment for the same reasons.

Doctrinal Default: There are no directed or restricted sensor systems.

Types of Entries:

- **Sensor Systems:** Target Base, Sound Ranging, Flash Ranging, Counter-Mortar Radar, Counter-Battery Radar, Ground Surveillance Radar.
- **Condition:** Directed, Restricted.
- **Time:** Inclusive date-time group for which the condition exists.
- **Area:** Description of the area in which the condition exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- **Source:** Unit ID. This is the identification of the commander who directed or restricted the sensor system. It tells other operators from which commander to request permission if they wish to override the guidance.

Other Guidance Affected:

- **Priority of Sensor System Selection Guidance.** Care must be taken that conflicting guidance (e.g., restricting a sensor system in an area under Sensor Systems Conditional Employment yet making that same sensor the first priority for use in the same area under Priority of Sensor System Selection Guidance) between these two items is not established.
- **System Specific Field Artillery Sensor System Location and Sector of Search Guidance** (if FA is involved). Directing or restricting sensor systems under the system nonspecific guidance may cause directing or restricting sensor systems at the system specific level to be unnecessary. It also has the potential to cause conflict in establishing guidance.

5.5.3.2 Priority of Sensor System Selection Guidance.

Purpose: Serves as a tie-breaker when more than one sensor system is available and capable of detecting targets that may be attacked with nuclear weapons.

Rationale: A commander may set this guidance after he has performed an analysis of his nuclear-capable and conventional attack assets, his available sensor systems, and the OPLAN/OPORD. His goal in establishing this guidance is to optimize the use of his sensors in a target-rich environment.

Doctrinal Defaults: There is no doctrinal default. Situational.

Types of Entries:

- **Sensor Systems:** Target Base, Sound Ranging, Flash Ranging, Counter-Mortar Radar, Counter-Battery Radar, Ground Surveillance Radar.
- **Time:** Inclusive date-time group for which the priority exists.
- **Area:** Description of the area in which the priority exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- **Priority:** 1-n. (the number of priorities that can be established will match the number of entries of sensor systems.)

Other Guidance Affected:

- **Sensor System Conditional Employment Guidance.** Care must be taken not to establish conflicting guidance between these two items. For example, a sensor which has been given a high priority for employment in Priority of Sensor Selection Guidance for a given area might have been restricted in that area in Sensor System Conditional Employment Guidance.

5.5.4 Nuclear Target Criteria And Standards Guidance.

Goals of the guidance items under this heading include identifying targets which may have informational value to a number of agencies and/or which may be duplicates. Guidance established here should increase the efficiency of nuclear fire planning.

5.5.4.1 Combat Information Selection Standards Guidance.

Purpose: Establishes defaults for the types of combat information routed to other addressees. Targets, about which information is passed to other addressees through the use of this guidance, continue to be processed for nuclear attack.

Rationale: Other agencies, such as intelligence and civil-military operations, will likely desire information about targets that are being processed for engagement by nuclear-capable attack assets.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- **Target Type/Subtype:** A list of target types/subtypes. "All" and "None" should be valid entries as well.
- **Area:** Description of the area in which the condition exists. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- **Time:** Inclusive date-time group in which you want combat information passed.

- **Enemy Activity:** Advancing, Withdrawing, Stationary, Fixed, Other. "All" should be a valid entry.
- **Addressee:** Unit ID. Specifies to whom the combat information is sent.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.4.2 Target Duplication Criteria Guidance.

Purpose: Sets criteria for determining whether information reported by more than one source is a duplicate target or a new target.

Rationale: With nuclear-capable attack assets and munitions limited, the commander is concerned with covering the target area in the manner that best supports the plan. To process duplicate targets wastes target processing time, fire mission processing time, and nuclear munitions. In addition to wasting scarce assets, inadvertent nuclear strikes on duplicate targets poses such problems as additional fallout, possible preinitiation, and violation of troop safety and preclusion guidance. The commander establishes guidance here to reduce the possibility of firing on duplicate targets by defining criteria to eliminate them. **Note:** Duplicate targets may come from observers/sensors who "see" a target from different vantage points and who do not report the same exact location or description for whatever reason.

Doctrinal Default: Minimum Correlation Probability = .75; Search Radius = 500 meters; TLE Overlap Weighting Factor = 1; Doctrinal Separation Weighting Factor = 1.

Types of Entries:

- **Minimum Correlation Probability:** A percentage, 1-100, represented as a decimal, 0.00-1.00.
- **Search Radius:** A number in meters, 1-9999.
- **TLE Overlap Weighting Factor:** A number, 0.0-1.0.
- **Description Correlation Weighting Factor:** A number, 0.0-1.0.
- **Target Decay Weighting Factor:** A number, 0.0-1.0.
- **Doctrinal Separation Weighting Factor:** A number, 0.0-1.0.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.5 Nuclear Target Processing Guidance.

This guidance allows the commander to express his targeting desires.

5.5.5.1 Excluded Target Attack Guidance.

Purpose: Allows the commander to exclude particular targets by type/subtype for engagement by nuclear-capable attack assets and munitions. The exclusion may be by type attack system, yield, specific time period, or specific activity within the target area.

Rationale: To establish guidance here, the commander must have considered the OPLAN requirements, and the status of his nuclear-capable attack assets and munitions. Guidance to exclude targets may be established to prevent firing on politically protected targets, to facilitate troop or civilian populace/refugee movement, to allow further IPB efforts, or simply to conserve nuclear assets.

Doctrinal Default: There is no doctrinal default. Situation.

Types of Entries:

- **Target Type/Subtype:** The list of target types/subtypes against which the exclusion applies.
- **Attack System:** Air, FA. The attack system which is excluded.
- **Nuclear Package/Subpackage:** The subpackage that is excluded.
- **Time:** Inclusive date-time group during which the exclusion exists.
- **Area:** Description of the area in which the exclusion exists. This may be a point and 5-digit radius, or a finite number of up to 12-digit grids.
- **Enemy Activity:** Advancing, Withdrawing, Stationary, Fixed, Other.
- **Source:** Unit ID. The identification of the commander who established the exclusion. It tells operators from whom to request permission if they wish to override the guidance.

Other Guidance Affected:

- **Conditional Employment Guidance.** Targets may be excluded by periods of time, in specific areas, or for particular nuclear-capable attack systems. This may conflict with guidance previously established at Attack Systems Conditional Employment Guidance. For example: ADA HVY may be excluded here for attack by air, but have been directed for attack by air at Attack Systems Conditional Employment.

5.5.5.2 Target Prioritization Guidance.

Purpose: Allows the commander to establish a priority for generic target types/subtypes in various enemy tactical situations.

Rationale: Targets will have changing levels of importance for engagement based upon the tactical situation in which they occur. Because of the legal, political, and tactical constraints involved with nuclear employment, commanders and staff planners at all echelons will place great emphasis on the selection of the most critical targets for nuclear engagement. A prioritization routine or algorithm within an automated planner will greatly facilitate the target selection process.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Target Source Value Guidance. See 5.5.5.3 below.
- Target Value Guidance. See 5.5.5.4 below.

Other Guidance Affected: This item of guidance affects no other guidance identified in this report.

5.5.5.3 Target Source Value Guidance.

Purpose: This guidance establishes target source values for use in the algorithm to assign target priorities.

Rationale: As the commander is performing target prioritization, he must consider the available sources for providing potential target information. He then weighs the importance of each of these sources as to the quality of information and the number of targets they may provide. He assigns a subjective value to each source, from 0 to 100, with 100 being the highest. For example, he may assign a value of 100 to the ground surveillance radar (GSR), while, because it is raining, assigning a value of 40 to forward observers (FO).

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Source: Forward Observer, Forward Observer without Laser, Observer not Artillery, Long-range Recon Patrol, Air Observer, Counter-Mortar Radar, Counter-Battery Radar, Sound Ranging, Flash Ranging, Photo Interpretation, Prisoner of War, Ground Surveillance Radar, Side-looking Airborne, Radar, Airborne Infrared, TActical Air, Communications Intelligence, Electronic Intelligence, CFVFMED, FSEVFMED, Other.
- Value: A number, 0-100.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.5.4 Target Value Guidance.

Purpose: This guidance establishes target values for use in the algorithm which assigns target priorities.

Rationale: The importance (i.e., value) of a target changes with the tactical situation.

Doctrinal Default: There is no doctrinal default. Situational. For example puposes: refer to the target spreadsheets representing three enemy tactical situations to see how values might change.

Types of Entries:

- Enemy Tactical Situation: Hasty Defense, Hasty River Crossing, Attack & Seize Subsequent Objective, Movement to Contact, Deliberate Defense, Withdrawal, and Meeting Engagement.
- Threat Echelon: Regiment, Division, Army, Front.
- Target Type/Subtype List: This is the list of Target Value Analysis (TVA) 15 target types and their associated subtypes. (See the examples.)

Other Guidance Affected: This item of guidance affects no other item of guidance.

5.5.5.5 Target Damage Assessment/Restrike Criteria Guidance.

Purpose: Allows the commander to decide whether to perform target damage assessment (TDA) on a particular target type/subtype. Also establishes restrike criteria based on the results of the target damage assessment.

Rationale: The commander selects the target types/subtypes on which to perform TDA as a means of determining whether he is achieving the desired effects in the target area or whether restrike is warranted.

Doctrinal Default: No targets are designated for TDA.

Types of Entries:

- Target Type/Subtype: This is the list of target types/subtypes.
- Time: Inclusive date-time group in which the designated target types/subtypes must appear.

- **Area:** Description of the area in which the target types/subtypes must appear. This may be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- **Posture:** Standing, Prone, Half Prone-Half Standing, Prone and Dug-In, Prone and Under Overhead Cover, Dug-in, Under Overhead Cover.
- **Activity:** Advancing, Withdrawing, Stationary, Fixed, Other.
- **Nuclear Package/Subpackage:** The package/subpackage that was planned/used in the strike.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.6 Support And Sustainment, Survivability And Safety Guidance For Nuclear Operations.

Allows the commander to enhance doctrine and SOP in these very critical, supporting areas based on current or anticipated situation, and in light of the OPLAN/OPORD.

5.5.6.1 OPSEC Guidance for Nuclear Operations.

Purpose: Allows the commander to establish guidelines which can aid in preventing detection of nuclear operations.

Rationale: Detection of nuclear operations will be a high priority of any threat intelligence efforts.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- **OPSEC Measures:** List of OPSEC measures which the commander wants implemented. May include physical security measures; information control; noise and light discipline; decoy operations, dummy positions, and deception; signal security; camouflage; terrain use; and movement of unit locations.
- **Time:** Effective date-time group for implementation of the OPSEC measure and any expiration time.
- **Area:** Description of the area in which the OPSEC measure will be used. May be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- **Source:** Unit ID. Identification of the commander who established the guidance. Lets the operator know from whom to request permission if he wants to change or override this guidance.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.6.2 Nuclear Munitions/Delivery Systems Security Guidance.

Purpose: Allows the commander to detail additional security measures based upon the current or anticipated situation.

Rationale: Positive security measures must be taken throughout all tasks within nuclear operations and at every echelon which performs nuclear operations to any degree.

Doctrinal Default: Security must be applied to all phases of requisition, receipt, issue, storage, maintenance, and shipment of nuclear ammunition. These requirements are detailed in ARs 50-5-1, 190-13, 380-5, 380-15, 380-20, 380-150, and in FMs 9-84, 19-30 and 100-50.

Types of Entries:

- List of Security Measures: As determined by the commander.
- Unit: Unit ID of the unit which the security measure affects, if applicable.
 - Time: Date-time group the security measure is in effect.
 - Area: Description of the area in which the security measure is in effect, if applicable. May be a point and 5-digit radius in meters, or a finite number of 12-digit grids.
 - Source: Unit ID. Identifies the commander who established the guidance. Lets the operator know from whom to request permission if he wants to change or override this guidance.

Other Guidance Affected: Because the following items of guidance all have security aspects, any guidance established under Nuclear Munitions/Delivery Systems Security Guidance should be compared to guidance established under each of them.

- OPSEC Guidance for Nuclear Operations.
- Guidance for the Distribution/Accountability of Nuclear Weapons.
- Nuclear Convoy Main Supply Route (MSR) Usage Guidance.
- Guidance on the Emergency Destruction of Nuclear Munitions/Delivery Systems.

5.5.6.3 Nuclear Convoy Main Supply Route (MSR) Usage Guidance.

Purpose: Allows the commander to detail his desires for nuclear weapons movement on MSRs.

Rationale: When nuclear ammunition leaves the NASP/WHA, the risk of it being seized or destroyed increases drastically.

Doctrinal Default:

- Minimum security personnel include: a courier officer or NCO; a driver and an assistant driver for each mission vehicle; and a security force in proportion to the expected threat.
- Nuclear weapons carriers are placed in the convoy to have maximum protection. Vehicles should not be marked so as to identify them as nuclear weapons carriers.
- Enough emergency destruction material will be carried in the convoy to destroy the nuclear weapons.

Types of Entries:

- List of Security Requirements: Dictated by the commander and tailored to the current/anticipated situation.
- List of Vehicle Requirements: Includes vehicles to carry nuclear weapons, security force vehicles, scout vehicle, and any additionally required vehicles.
- List of Nuclear Munitions to be Moved: By number and type.
- Personnel Requirements: Includes the courier, drivers, assistant drivers, security force personnel, and any others.
- Route Identification: May be identified by 12-digit grids signifying route segments, by a codename (e.g., "Route: Blue"), or by a local route number or name.
- Time Schedule: Date-time groups for departure, arriving at checkpoints, and at the release point.
- List of Checkpoints: May be identified by numbers, by 12-digit grids, and/or by codename.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.6.4 Nuclear Munitions Storage Procedures Guidance.

Purpose: Allows the commander to establish storage procedures for nuclear weapons based on the current or anticipated tactical situation.

Rationale: While storage procedures in doctrinal manuals are detailed and definitive, they do not provide for the tactical situation as it is actually occurring or anticipated. To ensure that nuclear munitions are stored correctly so they will be free from damage and secure may require additional measures.

Doctrinal Default: As a minimum:

- Units having custody of nuclear weapons will establish a field storage location inside their defensive perimeter.
- Access to nuclear weapons will be controlled by two Personnel Reliability Program (PRP) qualified guards.

Types of Entries:

- List of Storage Requirements: Dictated by the commander and tailored to the current/anticipated situation.
- Unit: Unit ID of the unit to which the storage requirements apply.
- Time: Date-time group the storage requirement is in effect.
- Area: Description of the area in which the storage requirement is in effect, if applicable. May be a point and 5-digit radius in meters, or a finite number of 12-digit grids.
- Source: Unit ID. Identifies the commander who established the guidance. Lets the operator know from whom to request permission if he wants to change or override this guidance.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.5.6 5 Guidance on the Emergency Destruction of Nuclear Munitions/Delivery Systems.

Purpose: Allows the commander to detail the conditions under which he will permit, and would desire, the nuclear munitions under his control to be destroyed.

Rationale: Emergency destruction of nuclear munitions is a command decision. In case the commander is not in the area, or has been wounded or killed, subordinates will be left with guidance in this area.

Doctrinal Default: Emergency destruction is mandatory when:

- Nuclear munitions are in danger of capture.
- The unit is unable to evacuate a part or all of its nuclear stocks during withdrawal.
- The NASP/WHA is threatened by a major penetration, a vertical envelopment, or a major attack by unconventional forces.

Types of Entries:

- Conditions List: The list of conditions under which the commander authorizes destruction.
- Source: Unit ID. Identification of the commander who established the guidance. Lets the operator know from whom to request permission if he wants to change or override this guidance.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6 SYSTEM SPECIFIC GUIDANCE.

For this effort, system specific guidance is established for those air fire support systems which will carry nuclear payloads, and for nuclear-capable field artillery fire support systems. The air systems include fighter and attack aircraft. The field artillery systems are the 155mm Howitzer, the 203mm Howitzer, and the Lance Missile.

5.6.1 System Specific Air Guidance.

Guidance under this heading applies to troop and noncombatant safety.

5.6.1.1 Guidance to Minimize In-Flight Danger to Aircrews.

Purpose: Allows the commander to specify the protective measures which should be taken by friendly troops based on their proximity to a nuclear strike.

Rationale: Friendly exposure to the effects of nuclear fires will not always be avoidable. Nuclear employment planners should recognize this fact and take steps to reduce friendly casualties as much as possible. The dangers to aircraft include degradation of the airframe and of pilot performance.

Doctrinal Default:

- Degree of Acceptable Risk to Friendly Troops: Negligible risk to unwarned, exposed personnel.

Types of Entries:

- Zone of Weapons Effects/Minimum Safe Distance: 1, 2, 3.
- Degree of Acceptable Risk to Friendly Troops: Number of casualties the commander is willing to accept.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.1.2 Collateral Damage Constraints Guidance.

Purpose: Allows the identification of collateral damage constraints, whether tactical or political, and provides a means for the commander to establish his preferences for reducing collateral damage.

Rationale: For the Air Force, collateral damage refers to damage to installations that are not targets in the option being executed, or damage that is not the objective of the desired ground zero (DGZ) from which the damage is being evaluated. Collateral damage constraints and military effectiveness must be balanced if operations are to be successful. There may be theater-level collateral damage constraints which must be identified down to the appropriate corps and divisions. If there are no theater-level constraints, lower echelon commanders may need to impose collateral damage constraints based on the civil-military

situations in their areas of operations. Imposing collateral damage constraints does not necessarily preclude conducting the nuclear fire mission. There are methods for reducing collateral damage, and through this item of guidance the commander may wish to state his preferences for using these methods.

Doctrinal Default:

- Degree of acceptable risk to noncombatants: 5% incidence of hospitalizing injuries at the edge of populated areas.
- Other entries are situational.

Types of Entries:

Step 1: Identification of Collateral Damage Constraints.

- Attack Systems: F-4, F-15, F-16, F-111, and the F-117.
- Response Times: Response times for each air attack system. Use actual response times, if known.
- Nuclear Payload: Payload yield.
- Area: Description of the area where noncombatants, facilities/structures, equipment are located in reference to the proposed nuclear target. These area descriptions may be a number of points and 5-digit radii in meters, or a finite number of up to 12-digit grids for each location.
- Noncombatants: Description of any noncombatants, to include their degree of protection if known, and the degree of acceptable risk to noncombatants.
- Structures, Facilities: Description of any structures or facilities for which damage should not exceed a specified level, and the specified level of acceptable damage.
- Equipment: Description of any equipment for which damage should not exceed a specified level, and the specified level of acceptable damage.
- Collateral Damage Distance: the minimum distance in meters that a desired ground zero (DGZ) must be separated from civilian personnel and materiel to ensure with a stated degree of assurance that a specific incidence of injuries or property damage will not be exceeded.

Step 2: Prioritize Preferences for Reducing Collateral Damage.

- List of Preferences:
 - Civil Defense Procedures: Evacuate Civilians from the Battlefield, Warn Civilians who cannot be Evacuated.
 - Reduced Yields.
 - Accurate Delivery System.
 - Offset DGZ.
 - Multiple Weapons.

--Adjusted Height of Burst.

- Commander's Prioritization: A number, 1-n, with 1 being first choice.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2 System Specific Field Artillery Attack Systems Guidance.

For this effort, the nuclear-capable field artillery attack systems are 155mm Howitzer, 203mm Howitzer, and the Lance Missile.

5.6.2.1 Number of Fire Units Per Nuclear Target Guidance.

Purpose: Allows the commander to specify a number of fire units to engage a target.

Rationale: After the commander considers the number of available field artillery attack assets and has a general knowledge of the effects he desires in the target area, he may establish this guidance as a means of effectively using his field artillery attack assets while achieving the desired target coverage.

Doctrinal Default: Use the smallest weapon, fire the smallest package with the smallest yields, and therefore the least number of fire units to attack the target.

Types of Entries:

- Type of FA System: 155mm, 203mm, Lance.
- Number of Fire Units Per Target: A number 1-99.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.2 Priority of Nuclear-Capable System Selection Guidance.

Purpose: Serves as a tie-breaker when more than one artillery system is capable and available to attack a specific target.

Rationale: Same as in System Nonspecific Priority of System Selection--except only field artillery assets are involved. Key to this item: more than one artillery system is capable and available.

Doctrinal Default: 155mm = 1; 203mm = 2.

Types of Entries:

- Types of FA Systems: 155mm, 203mm, Lance.

- Priority: a number, 1-n, with n = 3 (since there are 3 artillery systems).

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.3 Guidance for Establishing Critical Thresholds on Field Artillery Attack Systems Status.

Purpose: Allows the commander to establish decision points (critical thresholds) at which he, or a designated representative, desires notified of the status of field artillery attack systems readiness.

Rationale: Whenever the field artillery attack system, as a whole--to include the weapon system, prescribed nuclear load, personnel, command and control, and/or associated combat service support functions, is not functioning at 100%, there is the potential for reduced mission accomplishment. The commander may want to know when his capabilities are reduced so that he can redetermine his ability to continue with planned missions.

Doctrinal Default: 85% mission capable, using doctrinal unit status reporting criteria.

Types of Entries:

- Attack System: 155mm, 203mm, Lance.
- Unit ID: Identification of the owning unit.
- Status Components: A list of major end-items and those items critical to mission accomplishment and/or about which the commander desires to track status.
 - % Mission Capable: A percentage representing the readiness of each status component, 0-100%.
 - Threshold %: A percentage, established by the commander, 0-100%.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.4 Prescribed Nuclear Load (PNL) Guidance.

Purpose: Allows the commander to detail how many nuclear weapons will be carried by organic or attached delivery units.

Rationale: This guidance is a logistics and operations problem. The establishment and replenishing of the PNL after each expenditure is a command decision and depends upon the tactical situation, the nuclear logistics situation, and the capabilities of the unit to receive, transport,

and utilize the load. Establishing guidance at this point allows the commander to deconflict his operational and logistical capabilities.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Unit: Unit ID. Identifies the unit for which this PNL applies.
- Attack System: 155mm, 203mm, Lance.
- Type of Nuclear Weapon (Yield): Y1, Y2, Y3.
- Number of Nuclear Weapons: A number, 1-n.
- Time: Effective date-time group this PNL is in effect.
- Source: Unit ID. Identifies the commander who established the guidance. Lets the operator know from whom to request permission if he wants to change or override this guidance.

Other Guidance Affected: If guidance is established under Prescribed Nuclear Load guidance, the guidance items below should be checked to ensure no conflicts are established:

- Number of Fire Units per Nuclear Target Guidance.
- Priority of Nuclear Capable System Selection Guidance.

5.6.2.5 Priority of Route Use Guidance.

Purpose: Establishes a route deconfliction plan for movement of units on the battlefield, based on their mission, their status, the known or anticipated threat, and battlefield conditions.

Rationale: The commander establishes this guidance to aid in command and control of the battlefield. He analyzes the known or suspected threat, the OPLAN/OPORD, the status of units assigned, attached, or OPCON to his headquarters and then prioritizes movement to ensure all elements are in the best location when necessary for optimal mission accomplishment. He may prioritize by type of field artillery system, by type of field artillery mission, or by type of field artillery unit.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Type of Field Artillery System: 155mm, 203mm, Lance.
- Type of Units: HHB, HHS, Firing Battery, Service Battery, Sensor, Firing Platoon, Launcher.
- Priority for Movement: a number, 1-n, with the highest number being equal to the total number of units.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.6 Priority of System Positioning Guidance.

Purpose: Establishes criteria for where a unit may position and assigns priorities to units based on their missions and the commander's desires.

Rationale: The commander may establish this guidance to ensure units are able to perform their designated missions effectively and efficiently. To set this guidance, the commander analyzes the known or suspected threat, reviews the OPLAN/OPORD, and considers the characteristics and capabilities of the units involved. This guidance applies to fire units as well as support units.

Doctrinal Default: 67% of the maximum range of the attack system must be past the FLOT.

Types of Entries:

- Type of Unit: 155mm, 203mm, HHB, 3X8 Firing Battery, 3X6 Firing Battery, Firing Platoon, HQ Platoon, Service Battery, HHS Battery, Launcher.
- Minimum Distance from FLOT: A distance, in kilometers.
- Maximum Distance from FLOT: A distance, in kilometers.
- Minimum Distance to Like Units: A distance, in kilometers.
- Maximum Distance from C2 Element: A distance, in kilometers.
- Restricted Position Areas: Describe as a point and radius in meters, or as a finite number of up to 12-digit grids.
- Priority of Units by Type Unit: a number, 1-n, based on the number of different types of units/elements--fire units, support units, C2 units, etc.
- Priority of Like Units: a number, 1-n, based on the number of competing like units--for example, there are 3 155SP howitzer batteries competing for the same position.

- **Other Guidance Affected:** This item of guidance affects no other item of guidance identified in this report.

5.6.2.7 Sensor Location and Sector of Search Guidance.

Purpose: Establishes criteria for positioning sensors and for specifying the percentages of the maximum range of the sensor that must be past the FLOT.

Rationale: After assessing the threat and reviewing his sensor assets, the commander may establish this guidance to effectively cover the target area.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- Sensor Systems: AN/TPQ-36; AN/TTS-58; AN/TPS-25; AN/TVQ-2.

- Minimum Distance from the FLOT: In number of kilometers.
- Priority of Location: Among competing sensor systems, which has priority? Each sensor on the list should be given a priority, 1-n, with n being the highest number of sensors on the list.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.8 Designated NASP/WHA Locations Guidance.

Purpose: To specify the locations of NASP and WHA to unit support personnel who are responsible for drawing and delivering nuclear weapons to their respective fire units.

Rationale: For enhanced survivability, fire units will move often, and so will the NASP and WHA. Unit support personnel must be kept informed of their current support locations to effectively support mission accomplishment.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- NASP/WHA Identification: Unit ID of the Nuclear Special Ammunition Ordnance Company operating a particular NASP/WHA.
- NASP/WHA Locations: A description of the area where the NASP/WHA will be located. May be a point and 5-digit radius in meters, or a finite number of up to 12-digit grids.
- Customer List: List of units supported from a particular NASP/WHA.
- Time: Effective date-time group the NASP/WHA will begin operations from a particular location.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.9 Maintenance of Attack Systems Guidance.

Purpose: Allows the commander to establish priorities for all types of maintenance among nuclear-capable and non-nuclear capable attack systems, sensors, C2 equipment, and other items of unit equipment.

Rationale: Since time and distance will normally be constraints on any battlefield, maintenance guidance assists unit personnel, in the maintenance section and in the firing sections, in better knowing what the commander's desires are for mission accomplishment.

Doctrinal Default: There is no doctrinal default. Situational.

Types of Entries:

- List of Unit Equipment: A listing of all major end-items and any other items of unit equipment which the commander deems critical to mission accomplishment.
- Priorities for Servicing, Repair, and Evacuation: A number, 1-n.

Other Guidance Affected:

- Priority of Route Use Guidance. Care must be taken not to establish conflicting guidance between these items. For example, a unit maintenance section may have very low priority for road use, but need to perform maintenance at a remote site on a critical piece of unit equipment.
- Priority of System Positioning Guidance. Care must be taken to position maintenance elements where they can provide the most responsive support.

5.6.2.10 **Troop Safety Guidance.**

Purpose: Allows the commander to specify the protective measures which should be taken by friendly troops based on their proximity to a nuclear strike.

Rationale: Friendly exposure to the effects of nuclear fires will not always be avoidable. Nuclear employment planners should recognize this fact and take steps to reduce friendly casualties as much as possible.

Doctrinal Default:

- Degree of Acceptable Risk to Friendly Troops: Negligible risk to unwarned, exposed personnel.

Types of Entries:

- Zone of Weapons Effects/Minimum Safe Distance: 1, 2, 3.
- Protective Measures: Evacuation, MOPP-4, MOPP-3, MOPP-2, MOPP-1, No Exposed Skin, Overhead Cover, No Protective Measures Required.
- Degree of Acceptable Risk to Friendly Troops:
 - Negligible risk to warned and protected personnel.

- Negligible risk to warned and exposed personnel.
- Negligible risk to unwarned and exposed personnel.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

5.6.2.11 Collateral Damage Constraints Guidance.

Purpose: Allows the identification of collateral damage constraints, whether tactical or political, and provides a means for the commander to establish his preferences for reducing collateral damage.

Rationale: For the Army, collateral damage refers to undesirable civilian personnel injuries or materiel damage produced by the effects of friendly nuclear weapons. Collateral damage constraints and military effectiveness must be balanced if operations are to be successful. There may be theater-level collateral damage constraints which must be identified down to the appropriate corps and divisions. If there are no theater-level constraints, lower echelon commanders may need to impose collateral damage constraints based on the civil-military situations in their areas of operations. Imposing collateral damage constraints does not necessarily preclude conducting the nuclear fire mission. There are methods for reducing collateral damage, and through this item of guidance the commander may wish to state his preferences for using these methods.

Doctrinal Default:

- Degree of acceptable risk to noncombatants: 5% incidence of hospitalizing injuries at the edge of populated areas.
- Other entries are situational.

Types of Entries:

Step 1: Identification of Collateral Damage Constraints.

- Attack Systems: 155mm, 203mm, Lance.
- Response Times: Response times for each field artillery attack system. Use actual response times, if known.
- Area: Description of the area where the attack system(s) is (are) located; and/or where noncombatants, facilities/structures, equipment are located in reference to the proposed nuclear target. These area descriptions may be a number of points and 5-digit radii in meters, or a finite number of up to 12-digit grids for each location.
- Noncombatants: Description of any noncombatants, to include their degree of protection if known, and the degree of acceptable risk to noncombatants.

- **Structures, Facilities:** Description of any structures or facilities for which damage should not exceed a specified level, and the specified level of acceptable damage.
- **Equipment:** Description of any equipment for which damage should not exceed a specified level, and the specified level of acceptable damage.
- **Collateral Damage Distance:** the minimum distance in meters that a desired ground zero (DGZ) must be separated from civilian personnel and materiel to ensure with a stated degree of assurance that a specific incidence of injuries or property damage will not be exceeded.

Step 2: Prioritize Preferences for Reducing Collateral Damage.

- **List of Preferences:**
 - Invoke Civil Defense Procedures: Evacuate Civilians from the Battlefield, Warn Civilians who cannot be Evacuated.
 - Use Reduced Yields.
 - Use a More Accurate Delivery System.
 - Use an Offset DGZ.
 - Use Multiple Weapons.
 - Use an Adjusted Height of Burst.
- **Commander's Prioritization:** A number, 1-n, with 1 being first choice.

Other Guidance Affected: This item of guidance affects no other item of guidance identified in this report.

Table 1. Target value for red regiment.

TARGET VALUE TABLE FOR RED REGIMENT										HASTY DEFENSE									
RED SITUATION-->																			
DMD TGT TYPE	DMD TGT SUBTYPE	TVA TGT SET	TGT TYPE VALUE	TGT SUBTYPE VALUE	TOTAL VALUE	DECAY RATE	<----->		ACTIVITY VALUES		<----->		TARGET VALUES						
							MOVING ADVANC- ING	MOVING WITH- DRAWING	STATION- ARY	FIXED	MOVING ADVANC- ING	MOVING WITH- DRAWING	STATION- ARY	FIXED					
SPECIAL	ON CALL	N/A	1	1	1	1010	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	ILL1GUN	N/A	1	1	1	10	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	ILL2GUN	N/A	1	1	1	10	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	ILL2GUND	N/A	1	1	1	10	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	ILL1GUNR	N/A	1	1	1	10	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	ILL4GUN	N/A	1	1	1	10	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	GAS NONP	N/A	1	1	1	10	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	GAS PERS	N/A	1	1	1	1	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	LLAFLET	N/A	1	1	1	0	0	0	0	0	0	0	N/A	N/A	N/A	N/A			
	UNKNOWN	MVR	5	4	20	7	20	10	10	10	15	0	47	37	42	N/A			
PERS	INFANTRY	MVR	5	7	35	7	20	10	10	15	0	62	52	57	N/A	N/A			
	OP	FS	7	7	49	6	15	10	10	20	0	70	65	75	N/A	N/A			
	PATROL	REC	1	2	2	7	20	15	10	10	0	29	24	19	N/A	N/A			
	WKPTY	LOC	4	3	12	6	15	10	10	20	0	33	28	38	N/A	N/A			
	POSITION	MVR	5	6	30	6	0	0	0	20	0	N/A	N/A	N/A	N/A	N/A			
	NOT GIVEN	MVR	5	4	20	7	20	10	10	15	0	47	37	42	N/A	N/A			
	UNKNOWN	MVR	5	4	20	6	15	10	10	20	0	41	36	46	N/A	N/A			
	LT M GUN	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
	AT GUN	MVR	5	6	30	6	15	10	10	20	0	51	46	56	N/A	N/A			
	RCLR	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
WEAPONS	POSITION	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
	NOT GIVEN	MVR	5	4	20	6	15	10	10	20	0	41	36	46	N/A	N/A			
	UNKNOWN	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
	LT M GUN	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
	AT GUN	MVR	5	6	30	6	15	10	10	20	0	51	46	56	N/A	N/A			
	RCLR	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
	POSITION	MVR	5	5	25	6	15	10	10	20	0	46	41	51	N/A	N/A			
	NOT GIVEN	MVR	5	4	20	6	15	10	10	20	0	41	36	46	N/A	N/A			
	UNKNOWN	FS	7	6	42	4	15	10	10	20	0	61	56	66	N/A	N/A			
	LIGHT	FS	7	6	42	4	15	10	10	20	0	61	56	66	N/A	N/A			
ARTILLERY	MEDIUM	FS	7	7	49	4	15	10	10	20	0	68	63	73	N/A	N/A			
	HEAVY	NUK/CH	8	8	64	3	15	10	10	20	0	82	77	87	N/A	N/A			
	VERY HWY	NUK/CH	8	8	64	3	15	10	10	20	0	82	77	87	N/A	N/A			
	POSITION	FS	7	7	49	4	0	0	0	20	0	N/A	N/A	73	N/A	N/A			
	NOT GIVEN	FS	7	6	42	4	15	10	10	20	0	61	56	66	N/A	N/A			
	UNKNOWN	FS	7	6	42	4	15	10	10	20	0	61	56	66	N/A	N/A			
	LIGHT	FS	7	6	42	4	15	10	10	20	0	61	56	66	N/A	N/A			
	MEDIUM	FS	7	8	42	3	15	10	10	20	0	74	77	79	N/A	N/A			
	HEAVY	NUK/CH	8	8	56	3	15	10	10	20	0	82	77	87	N/A	N/A			
	POSITION	FS	7	7	64	3	0	0	0	20	0	N/A	55	72	N/A	N/A			

Table 1. Target value for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT																
RED SITUATION-->>										HASTY DEFENSE						

Table 1. Target value for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT																			
RED SITUATION -->																			
HASTY DEFENSE																			
DMD TGT TYPE	DMD TGT SUBTYPE	TVA TGT SET	TGT TYPE VALUE	TGT SUBTYPE VALUE	TOTAL VALUE	DECAY RATE	MOVING ADVANC- ING	ACTIVITY VALUES		STATION- ARY	FIXED	MOVING ADVANC- ING	MOVING WITH- DRAWING		STATION- ARY	FIXED	TARGET VALUES		
								MOVING WITH- DRAWING	MOVING WITH- DRAWING				MOVING WITH- DRAWING	MOVING WITH- DRAWING			MOVING WITH- DRAWING	MOVING WITH- DRAWING	
EOPT	NOT GIVEN	C3	5	4	20	2	15	10	10	20	0	37	32	32	42	0	N/A	N/A	
	UNKNOWN	LIFT	1	1	1	7	15	10	10	20	0	23	18	18	28	0	N/A	N/A	
	RADAR	FS	7	7	49	5	15	10	10	20	0	69	64	64	74	0	N/A	N/A	
	EW	RSTA	3	4	12	5	15	10	10	20	0	32	27	27	37	0	N/A	N/A	
	SLT	N/A	1	1	1	5	15	10	10	20	0	21	16	16	26	0	N/A	N/A	
	GUIDANCE	RSTA	3	4	12	5	15	10	10	20	0	32	27	27	37	0	N/A	N/A	
	LOUDSPDR	N/A	1	1	1	5	15	10	10	20	0	21	16	16	26	0	N/A	N/A	
	NOT GIVEN	LIFT	1	1	1	5	15	10	10	20	0	21	16	16	26	0	N/A	N/A	
	UNKNOWN	N/A	1	1	1	5	15	10	10	20	0	21	16	16	26	0	N/A	N/A	
	WOODEN	N/A	1	1	1	0	0	0	0	15	20	N/A	N/A	N/A	16	20	N/A	21	
BUILDINGS	MASRY	N/A	1	1	1	0	0	0	0	15	20	N/A	N/A	N/A	16	20	N/A	21	
	CONCRETE	N/A	1	1	1	0	0	0	0	15	20	N/A	N/A	N/A	16	20	N/A	21	
	METAL	N/A	1	1	1	0	0	0	0	15	20	N/A	N/A	N/A	16	20	N/A	21	
	SPECIAL	NUK/CH	8	8	64	0	0	0	0	15	20	N/A	N/A	N/A	16	20	N/A	21	
	NOT GIVEN	N/A	1	1	1	0	0	0	0	15	20	N/A	N/A	N/A	16	20	N/A	21	
	UNKNOWN	LOC	4	3	12	0	10	5	5	15	20	22	17	17	27	20	N/A	32	
	FOOT PON	ENG	1	1	1	0	10	5	5	15	20	11	6	6	16	20	N/A	21	
	VEH PON	ENG	1	1	1	0	10	5	5	15	20	11	6	6	16	20	N/A	21	
	CONCRETE	LOC	4	5	20	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	40	
	WOODEN	LOC	4	5	20	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	40	
BRIDGES	STEEL	LOC	4	5	20	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	40	
	SITE	ENG	1	1	1	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	21	
	RAFT	ENG	1	1	1	5	20	10	10	15	0	26	16	16	21	0	N/A	N/A	
	FERRY	ENG	1	1	1	5	20	10	10	15	0	26	16	16	21	0	N/A	N/A	
	NOT GIVEN	LOC	4	3	12	0	10	5	5	15	20	22	17	17	27	20	N/A	32	
	UNKNOWN	N/A	1	1	1	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	21	
	ROAD	LOC	4	4	16	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	40	
	JUNCTION	LOC	4	5	20	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	40	
	HILL	N/A	1	1	1	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	21	
	DEFILE	LOC	4	4	16	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	36	
TERRAIN	LDG STRP	LOC	4	4	16	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	36	
	RAILROAD	LOC	4	4	16	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	36	
	NOT GIVEN	N/A	1	1	1	0	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	21	
	UNKNOWN	MVR	5	4	20	3	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	43	
	TROOPS	MVR	5	5	25	3	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	48	
	TRP & VEH	MVR	5	5	25	3	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	48	
	TRP MECH	MVR	5	6	30	3	0	0	0	0	20	N/A	N/A	N/A	N/A	20	N/A	53	

Table 1. Target value for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT													
RED SITUATION-->>				HASTY DEFENSE									

Table 1. Target value for red regiment (continued).

[illegible]

Table 1. Target value for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT														
RED SITUATION -->				HASTY RIVER CROSSING										
DMD TGT TYPE	DMD TGT SUBTYPE	TVA TGT SET	TGT TYPE VALUE	TGT SUBTYPE VALUE	TOTAL VALUE	DECAY RATE	<----- ACTIVITY VALUES ----->			<----- TARGET VALUES ----->				
							MOVING ADVANC- ING	MOVING WITH- DRAWING	STATION- ARY	MOVING ADVANC- ING	MOVING WITH- DRAWING	STATION- ARY		
ADA	UNKNOWN	ADA	5	4	20	3	0	0	20	0	N/A	N/A	43	N/A
	LIGHT	ADA	5	5	25	7	15	10	20	0	47	42	52	N/A
	MEDIUM	ADA	5	6	30	5	10	5	15	20	45	40	50	55
	HEAVY	ADA	5	6	30	0	10	5	15	20	43	35	45	50
	MISSILE	ADA	5	6	30	3	10	5	15	20	43	38	48	53
	POSITION	ADA	5	5	25	3	0	0	15	20	N/A	N/A	43	48
	NOT GIVEN	ADA	5	4	20	3	10	5	15	20	33	28	38	43

Table 1. Target value table for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT												
RED SITUATION-->			ATK & SIZE SUBSEQUENT OBJECTIVE									
DMD TGT TYPE	DMD TGT SUBTYPE	TVA TGT SET	TGT TYPE VALUE	TGT SUBTYPE VALUE	TOTAL VALUE	DECAY RATE	ACTIVITY VALUES			FIXED	TARGET VALUES	
							MOVING ADVANC- ING	MOVING WITH- DRAWING	STATION- ARY		MOVING ADVANC- ING	MOVING WITH- DRAWING
SPECIAL	ON CALL	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	ILL 1GUN	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	ILL 2GUN	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	ILL 2GUND	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	ILL 2GUNR	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	ILL 4GUN	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	GAS NONP	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	GAS PERS	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	LEAFLET	N/A	1	1	1	10	0	0	0	0	N/A	N/A
	UNKNOWN	MVR	6	5	30	7	20	10	15	0	57	47
PERS	INFANTRY	MVR	6	8	48	7	20	10	15	0	75	65
	OP	FS	7	7	49	6	15	10	20	0	70	65
	PATROL	REC	1	2	2	7	20	15	10	0	29	24
	WKPTV	LOC	3	2	6	6	15	10	20	0	27	22
	POSITION	MVR	6	7	42	6	0	0	20	0	N/A	N/A
	NOT GIVEN	MVR	6	5	30	7	20	10	15	0	57	47
	UNKNOWN	MVR	6	5	30	6	15	10	20	0	51	46
	LT M GUN	MVR	6	6	36	6	15	10	20	0	57	52
	AT GUN	MVR	6	7	42	6	15	10	20	0	63	58
	HVY M GUN	MVR	6	7	42	6	15	10	20	0	63	58
MORTARS	RCLR	MVR	6	6	36	6	15	10	20	0	57	52
	POSITION	MVR	6	6	36	6	15	10	20	0	57	52
	NOT GIVEN	MVR	6	5	30	6	15	10	20	0	51	46
	UNKNOWN	FS	7	6	42	4	15	10	20	0	61	56
	LIGHT	FS	7	6	42	4	15	10	20	0	61	56
	MEDIUM	FS	7	7	49	4	15	10	20	0	68	63
	HEAVY	NUK/CH	8	8	64	3	15	10	20	0	82	77
	VERY HVY	NUK/CH	8	8	64	3	15	10	20	0	82	77
	POSITION	FS	7	7	49	4	0	0	20	N/A	N/A	N/A
	NOT GIVEN	FS	7	6	42	4	15	10	20	0	61	56
ARTILLERY	UNKNOWN	FS	7	6	42	4	15	10	20	0	61	56
	LIGHT	FS	7	6	42	4	15	10	20	0	61	56
	MEDIUM	FS	7	6	42	4	15	10	20	0	61	56
	HEAVY	NUK/CH	8	8	64	3	15	10	20	0	82	77
	POSITION	FS	7	7	49	3	15	10	20	0	82	77
	NOT GIVEN	FS	7	6	42	3	15	10	20	0	82	77
	UNKNOWN	MVR	6	5	30	8	20	10	15	0	58	48
	ARMOR											

Table 1. Target value table for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT																		
RED SITUATION-->			ATK & SIZE SUBSEQUENT OBJECTIVE															

Table 1. Target value table for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT																			
RED SITUATION--> ATK & SEIZE SUBSEQUENT OBJECTIVE																			
DMD TGT TYPE	DMD TGT SUBTYPE	TVA TGT SET	TGT TYPE VALUE	TGT SUBTYPE VALUE	TOTAL VALUE	DECAY RATE	ACTIVITY VALUES			MOVING ADVANCING			TARGET VALUES						
							MOVING WITH- DRAWING	ADVANCING	STATION- ARY	MOVING WITH- DRAWING	ADVANCING	STATION- ARY	MOVING WITH- DRAWING	ADVANCING	STATION- ARY				
	RADAR	FS	7	7	49	5	10	15	20	0	69	0	64	74	N/A				
	HILL	N/A	1	1	1	0	0	0	0	20	N/A	20	N/A	N/A	21				
	DEFILE	LOC	3	3	9	0	0	0	0	20	N/A	20	N/A	N/A	29				
	LDG STRP	LOC	3	3	9	0	0	0	0	20	N/A	20	N/A	N/A	29				
	RAILROAD	LOC	3	3	9	0	0	0	0	20	N/A	20	N/A	N/A	29				
	NOT GIVEN	N/A	1	1	1	0	0	0	0	20	N/A	20	N/A	N/A	21				
ASSY AREA	UNKNOWN	MVR	6	5	30	3	0	0	0	20	N/A	20	N/A	N/A	53				
	TROOPS	MVR	6	6	36	3	0	0	0	20	N/A	20	N/A	N/A	59				
	TRP & VEH	MVR	6	5	30	3	0	0	0	20	N/A	20	N/A	N/A	59				
	TRP MECH	MVR	6	7	42	3	0	0	0	20	N/A	20	N/A	N/A	65				
	TRP & ARM	MVR	6	7	42	3	0	0	0	20	N/A	20	N/A	N/A	65				
	NOT GIVEN	MVR	6	5	30	3	0	0	0	20	N/A	20	N/A	N/A	53				
ADA	UNKNOWN	ADA	6	5	30	3	0	0	20	0	N/A	0	N/A	N/A	53				
	LIGHT	ADA	6	6	36	7	10	15	20	0	58	0	53	63	N/A				
	MEDIUM	ADA	6	7	42	5	5	10	15	20	57	20	52	62	67				
	HEAVY	ADA	6	7	42	0	5	10	15	20	52	20	47	57	62				
	MISSILE	ADA	6	7	42	3	5	10	15	20	55	20	50	60	65				
	POSITION	ADA	6	6	36	3	0	0	15	20	N/A	20	N/A	54	59				
	NOT GIVEN	ADA	6	5	30	3	5	10	15	20	43	20	38	48	53				
	EW	RSTA	2	3	6	5	10	15	20	0	26	0	21	31	N/A				
	SLT	N/A	1	1	1	5	10	15	20	0	21	0	16	26	N/A				
	GUIDANCE	RSTA	2	3	6	5	10	15	20	0	26	0	21	31	N/A				
	LOUDSPKR	N/A	1	1	1	5	10	15	20	0	21	0	16	26	N/A				
	NOT GIVEN	LIFT	1	1	1	5	10	15	20	0	21	0	16	26	N/A				
BUILDINGS	UNKNOWN	N/A	1	1	1	0	0	0	15	20	N/A	20	N/A	16	21				
	WOODEN	N/A	1	1	1	0	0	0	15	20	N/A	20	N/A	16	21				
	MASNRY	N/A	1	1	1	0	0	0	15	20	N/A	20	N/A	16	21				
	CONCRETE	N/A	1	1	1	0	0	0	15	20	N/A	20	N/A	16	21				
	METAL	N/A	1	1	1	0	0	0	15	20	N/A	20	N/A	16	21				
	SPECIAL	NUK/CH	8	8	64	0	0	0	15	20	N/A	20	N/A	70	84				
BRIDGES	NOT GIVEN	N/A	1	1	1	0	0	0	15	20	N/A	20	N/A	16	21				
	UNKNOWN	LOC	3	2	6	0	5	10	15	20	16	20	11	21	26				
	FOOT PON	ENG	2	1	2	0	5	10	15	20	12	20	7	17	22				
	VEH PON	ENG	2	2	4	0	5	10	15	20	14	20	9	19	24				
	CONCRETE	LOC	3	4	12	0	0	0	0	20	N/A	20	N/A	N/A	32				
	WOODEN	LOC	3	2	6	0	0	0	0	20	N/A	20	N/A	N/A	26				
	STEEL	LOC	3	4	12	0	0	0	0	20	N/A	20	N/A	N/A	32				

Table 1. Target value table for red regiment (continued).

TARGET VALUE TABLE FOR RED REGIMENT																			
RED SITUATION --> ATK & SEIZE SUBSEQUENT OBJECTIVE																			
DMD TGT TYPE	DMD TGT SUBTYPE	TVA TGT SET	TGT TYPE VALUE	TGT SUBTYPE VALUE	TOTAL VALUE	DECAY RATE	<--- ACTIVITY VALUES --->			<--- MOVING ADVANCE- ING --->			---> TARGET VALUES --->			FIXED	STATION- ARY	FIXED	STATION- ARY
							MOVING DRAWING	WITH- DRAWING	MOVING DRAWING	MOVING DRAWING	ADVANC- ING	FIXED	MOVING DRAWING	WITH- DRAWING	MOVING DRAWING				
TERRAIN	SITE	ENG	2	2	4	0	0	0	0	0	0	20	N/A	N/A	N/A	24	N/A	24	N/A
	RAFT	ENG	2	2	4	5	10	10	10	20	20	0	15	19	19	24	24	N/A	N/A
	FERRY	ENG	2	2	4	5	10	10	10	20	20	0	15	19	19	24	24	N/A	N/A
	NOT GIVEN	LOC	3	2	6	0	5	5	5	10	10	20	15	11	11	21	21	26	26
	UNKNOWN	N/A	1	1	1	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	21	21
	ROAD	LOC	3	3	9	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	29	29
	JUNCTION	LOC	3	4	12	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	32	32
	HILL	N/A	1	1	1	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	21	21
	DEFILE	LOC	3	3	9	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	29	29
	LDG STRP	LOC	3	3	9	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	29	29
ASSYAREA	RAILROAD	LOC	3	3	9	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	29	29
	NOT GIVEN	N/A	1	1	1	0	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	29	29
	UNKNOWN	MVR	6	5	30	3	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	53	53
	TROOPS	MVR	6	6	36	3	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	59	59
	TRP & VEH	MVR	6	6	36	3	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	59	59
ADA	TRP MECH	MVR	6	7	42	3	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	65	65
	NOT GIVEN	MVR	6	5	30	3	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	53	53
	UNKNOWN	ADA	6	5	30	3	0	0	0	0	0	20	0	N/A	N/A	N/A	N/A	53	N/A
	LIGHT	ADA	6	6	36	7	15	10	10	15	15	0	20	53	53	63	63	N/A	N/A
	MEDIUM	ADA	6	7	42	5	10	5	5	10	10	30	15	52	52	62	62	65	65
	HEAVY	ADA	6	7	42	0	10	5	5	10	10	20	15	47	47	57	57	65	65
	MISSILE	ADA	8	7	42	3	10	5	5	10	10	20	15	50	50	60	60	65	65
	POSITION	ADA	6	6	36	3	0	0	0	0	0	20	15	N/A	N/A	54	54	55	55
	NOT GIVEN	ADA	6	5	30	3	10	5	5	10	10	20	15	38	38	48	48	5	5

Table 2. Doctrinal target characteristics.

DOCTRINAL TARGET CHARACTERISTICS: REGIMENT - ATTACK & SIZE SUBSEQUENT OBJECTIVE							
				DOCTRINAL POTENTIAL			
				SEPARATION EFFECTS			
DMD TGT	DMD TGT			RADIUS			
TYPE	SUBTYPE			<METERS>		TGT DESCRIPTION	POTENTIAL EFFECTS RADIUS RATIONALE
-----	-----	-----	-----	-----	-----	-----	-----
PERSONNEL	UNKNOWN	10	800			DISMNTD SQUAD/PLT/CO/BN	Effective range of machine gun <RPK-74>
PERSONNEL	INFANTRY	10	800			DISMNTD SQUAD/PLT/CO/BN	Effective range of machine gun <RPK-74>
PERSONNEL	OBS POST	300	800			DISMNTD ARTY CO	Effective range of machine gun <RPK-74>
PERSONNEL	PATROL	400	800			DISMNTD SQUAD PER CO	Effective range of machine gun <RPK-74>
PERSONNEL	WORK PARTY	400	800			DISMNTD SQ/JAD PER CO	Effective range of machine gun <RPK-74>
PERSONNEL	POSITION	50	800			DISMNTD SQUAD/PLT/CO/CN PSN	Effective range of machine gun <RPK-74>
PERSONNEL	NOT GIVEN	10	800			DISMNTD SQUAD/PLT/CO/BN	Effective range of machine gun <RPK-74>
WEAPONS	UNKNOWN	50	800			1 RPK-74 PER SQUAD	Effective range of machine gun <RPK-74>
WEAPONS	LT MCH GUN	50	800			1 RPK-74 PER SQUAD	Effective range of machine gun <RPK-74>
WEAPONS	AT GUN	400	1000			1 PER COMPANY	Effective range of 73mm AT gun
WEAPONS	HVY MCH GUN	50	1500			1 DShK-467 PER SQUAD	Effective range of DShK-46
WEAPONS	RECOIL RIFLE	400	800			1 PER COMPANY	Effective range of RPG-16
WEAPONS	POSITION	400	1000			1 PER COMPANY	Effective range of 73mm AT gun
WEAPONS	NOT GIVEN	50	800			1 PER SQUAD	Effective range of machine gun <RPK-74>
MORTARS	UNKNOWN	2000	5700			120mm BATTERY - 1 PER BN	Max range of 120mm mortar
MORTARS	LIGHT	2000	5700			120mm BATTERY - 1 PER BN	Max range of 120mm mortar
MORTARS	MEDIUM	2000	5700			120mm BATTERY - 1 PER BN	Max range of 120mm mortar
MORTARS	HEAVY	4000	9700			240mm BATTERY - 1 PER REGT	Max range of 240mm mortar
MORTARS	VERY HVY	4000	9700			240mm BATTERY - 1 PER REGT	Max range of 240mm mortar
MORTARS	POSITION	2000	5700			120mm BATTERY - PER BN	Max range of 120mm mortar
MORTARS	NOT GIVEN	2000	5700			120mm BATTERY - 1 PER BN	Max range of 120mm mortar
ARTILLERY	UNKNOWN	700	15300			122mm BATTERY	Max range of 122mm howitzer
ARTILLERY	LIGHT	700	15300			122mm BATTERY	Max range of 122mm howitzer
ARTILLERY	MEDIUM	700	17230			152mm BATTERY	Max range of 152mm howitzer
ARTILLERY	HEAVY	4000	30000			203mm BATTERY	Max range of 203mm howitzer
ARTILLERY	POSITION	700	15300			122mm BATTERY	Max range of 122mm howitzer
ARTILLERY	NOT GIVEN	700	15300			122mm BATTERY	Max range of 122mm howitzer
ARMOR	UNKNOWN	50	1500			BTR/BMP SQUAD/PLT/CO/BN	Effective range of DShK-46
ARMOR	LIGHT	50	1500			BTR/BMP SQUAD/PLT/CO/BN	Effective range of DShK-46
ARMOR	MEDIUM	500	2000			T-64/72 PLT	Effective range of 125mm gun
ARMOR	HEAVY	500	2000			T-64/72 PLT	Effective range of 125mm gun
ARMOR	APC	50	1500			BTR/BMP SQUAD/PLT/CO/BN	Effective range of DShK-46

Table 2. Doctrinal target characteristics (continued).

DOCTRINAL TARGET CHARACTERISTICS: REGIMENT - ATTACK & SIZE SUBSEQUENT OBJECTIVE					
				DOCTRINAL POTENTIAL	
				SEPARATION EFFECTS	
DMD TGT	DMD TGT				
TYPE	SUBTYPE	DISTANCE <METERS>	RADIUS <METERS>	POTENTIAL EFFECTS	POTENTIAL EFFECTS RADIUS RATIONALE
ARMOR	POSITION	2000	2000		Effective range of 125mm gun
ARMOR	NOT GIVEN	50	1500		Effective range of DShK-46
VEHICLES	UNKNOWN	400	800		Effective range of machine gun <RPK-74>
VEHICLES	LT WHEEL	400	800		Effective range of machine gun <RPK-74>
VEHICLES	HVY WHEEL	400	800		Effective range of machine gun <RPK-74>
VEHICLES	RECON	400	1500		Effective range of DShK-46
VEHICLES	BOAT	2000	3450		Bn frontage radius <1250> + effective range of 125mm gun
VEHICLES	AIRCRAFT	10000	1300000		Combat radius of H1P
VEHICLES	HELICOPTER	10000	200000		Combat radius of H1P
VEHICLES	NOT GIVEN	400	800		Effective range of machine gun <RPK-74>
RKT/MSL	UNKNOWN	50	4000		Effective range of Spandrel
RKT/MSL	ANTI-PERS	700	20380		Max range of BM-21
RKT/MSL	LT MISSILE	700	20380		Max range of BM-21
RKT/MSL	MED MISSILE	2000	900000		Operational range of SS-12.22
RKT/MSL	HVY MISSILE	2000	900000		Operational range of SS-12.22
RKT/MSL	ANTI-TANK	50	4000		Effective range of Spandrel
RKT/MSL	POSITION	700	20380		Max range of BM-21
RKT/MSL	NOT GIVEN	50	4000		Effective range of Spandrel
SUPPLY	UNKNOWN	400	1800		Co. frontage radius <300> + effective range of DShK-46
SUPPLY	AMMO	400	1800		Co. frontage radius <300> + effective range of DShK-46
SUPPLY	PETROLEUM	400	1800		Co. frontage radius <300> + effective range of DShK-46
SUPPLY	BRIDGE EQUIP	2000	3450		Bn frontage radius <1250> + effective range of 125mm gun
SUPPLY	CLASS I	1000	3450		Bn frontage radius <1250> + effective range of 125mm gun
SUPPLY	CLASS II	1000	3450		Bn frontage radius <1250> + effective range of 125mm gun
SUPPLY	NOT GIVEN	400	1800		Co. frontage radius <300> + effective range of DShK-46
CENTERS	UNKNOWN	300	3450		Bn frontage radius <1250> + effective range of 125mm gun
CENTERS	SMALL	400	1800		Co. frontage radius <300> + effective range of DShK-46
CENTERS	BATTALION	300	3450		Bn frontage radius <1250> + effective range of 125mm gun
CENTERS	REGIMENT	2000	4500		Regt frontage radius <2500> + effective range of 125mm gun
CENTERS	DIVISION	2000	7000		Div frontage radius <5000> + effective range of 125mm gun
CENTERS	FORWARD	2000	7000		Div frontage radius <5000> + effective range of 125mm gun
CENTERS	NOT GIVEN	300	3450		Bn frontage radius <1250> + effective range of 125mm gun

Table 2. Doctrinal target characteristics (continued).

DOCTRINAL TARGET CHARACTERISTICS: REGIMENT - ATTACK & SIEZE SUBSEQUENT OBJECTIVE									
				DOCTRINAL POTENTIAL					
				SEPARATION EFFECTS					
DMD TGT	DMD TGT			RADIUS					
TYPE	SUBTYPE			←METERS→		TGT DESCRIPTION		POTENTIAL EFFECTS RADIUS RATIONALE	
				←METERS→					
EQUIPMENT	UNKNOWN	100	800		ANY EQUIPMENT			Effective range of machine gun <RPK-74>	
EQUIPMENT	RADAR	1000	30000		SMALL & BIG FRED/CMB/MET			Estimated Range of Big Fred	
EQUIPMENT	ELEC WARFARE	2000	55000		COMM JAM/INTCPT/DF			Estimated Range of R-123M Transceiver	
EQUIPMENT	SEARCHLIGHT	100	400		NO CORRESPONDING TARGET			Effective range of searchlight	
EQUIPMENT	GUIDANCE	2000	250000		YTD PTS/AIR NAV/GCI/ADA			Estimated Range of Flat Face Radar	
EQUIPMENT	LOUDSPEAKER	100	400		NO CORRESPONDING TARGET			Estimated Range of halter/hand-held	
EQUIPMENT	NOT GIVEN	100	800		ANY EQUIPMENT			Effective range of machine gun <RPK-74>	
BUILDING	UNKNOWN	100	800					Effective range of machine gun <RPK-74>	
BUILDING	WOODEN	100	800					Effective range of machine gun <RPK-74>	
BUILDING	MASONRY	100	800					Effective range of machine gun <RPK-74>	
BUILDING	CONCRETE	100	800					Effective range of machine gun <RPK-74>	
BUILDING	METAL	100	800					Effective range of machine gun <RPK-74>	
BUILDING	SPEC PURPOSE	5000	7000		SASP			Div frontage radius <5000> + effective range c. 125mm gun	
BUILDING	NOT GIVEN	100	800					Effective range of machine gun <RPK-74>	
BRIDGE	UNKNOWN	100	800		ANY BRIDGE			Effective range of machine gun <RPK-74>	
BRIDGE	FOOT PONTOON	100	800		FOOT BRIDGE			Effective range of machine gun <RPK-74>	
BRIDGE	VEH PONTOON	2000	3450		BN CROSSING SITE			BN frontage radius <1250> + effective range of 125mm gun	
BRIDGE	CONCRETE	100	3450		ANY BRIDGE			BN frontage radius <1250> + effective range of 125mm gun	
BRIDGE	WOODEN	100	800		ANY BRIDGE			Effective range of machine gun <RPK-74>	
BRIDGE	STEEL	100	3450		ANY BRIDGE			BN frontage radius <1250> + effective range of 125mm gun	
BRIDGE	SITE	2000	3450		BN CROSSING SITE			BN frontage radius <1250> + effective range of 125mm gun	
BRIDGE	RAFT	2000	3450		BN CROSSING SITE			BN frontage radius <1250> + effective range of 125mm gun	
BRIDGE	FERRY	2000	3450		BN CROSSING SITE			BN frontage radius <1250> + effective range of 125mm gun	
BRIDGE	NOT GIVEN	100	800		ANY BRIDGE			Effective range of machine gun <RPK-74>	
TERRAIN	UNKNOWN	100	800		ANY TERRAIN			Effective range of machine gun <RPK-74>	
TERRAIN	ROAD	100	1500		ROAD			Effective range of DShK-46	
TERRAIN	JUNCTION	100	1500		JUNCTION			Effective range of DShK-46	
TERRAIN	HILL	100	1500		HILL			Effective range of DShK-46	
TERRAIN	DEFILE	100	800		DEFILE			Effective range of machine gun <RPK-74>	
TERRAIN	LANDG STRIP	10000	1300000		AUTOBAHN AIRSTRIP			Combat radius of MIG-23	
TERRAIN	RAILROAD	100	800		RAILROAD			Effective range of machine gun <RPK-74>	
TERRAIN	NOT GIVEN	100	800		ANY TERRAIN			Effective range of machine gun <RPK-74>	

Table 2. Doctrinal target characteristics (continued).

DOCTRINAL TARGET CHARACTERISTICS: REGIMENT - ATTACK & SIZE SUBSEQUENT OBJECTIVE									
			DOCTRINAL POTENTIAL						
			SEPARATION EFFECTS						
DMD TGT	DMD TGT		RADIUS						
TYPE	SUBTYPE		<METERS>						POTENTIAL EFFECTS RADIUS RATIONALE
ASSY AREA	UNKNOWN	2000	3450		BN ASSEMBLY AREA				Bn frontage radius <1250> + effective range of 125mm gun
ASSY AREA	TROOPS	2000	3450		BN ASSEMBLY AREA				Bn frontage radius <1250> + effective range of 125mm gun
ASSY AREA	TROOPS & VEH	2000	3450		BN ASSEMBLY AREA				Bn frontage radius <1250> + effective range of 125mm gun
ASSY AREA	MECH TROOPS	2000	3450		BN ASSEMBLY AREA				Bn frontage radius <1250> + effective range of 125mm gun
ASSY AREA	TROOPS & ARMR	2000	3450		BN ASSEMBLY AREA				Bn frontage radius <1250> + effective range of 125mm gun
ASSY AREA	NOT GIVEN	2000	3450		BN ASSEMBLY AREA				Bn frontage radius <1250> + effective range of 125mm gun
AIR DEFENSE	UNKNOWN	400	6000		ZSU 23-4/SA-7/9				Operational range of SA-9
AIR DEFENSE	LIGHT	400	6000		ZSU 23-4/SA-7/9				Operational range of SA-9
AIR DEFENSE	MEDIUM	4000	24000		SA-6/8				Operational range of SA-6
AIR DEFENSE	HEAVY	5000	100000		SA-4/12				Operational range of SA-4
AIR DEFENSE	MISSILE	400	100000		SA-4/6/8/12				Operational range of SA-4
AIR DEFENSE	POSITION	4000	100000		SA-4/6/7/8/12				Operational range of SA-4
AIR DEFENSE	NOT GIVEN	400	6000		ZSU 23-4/SA-7/9				Operational range of SA-9

SECTION 6

TRAINING OBSERVATIONS

6.1 GENERAL.

Commanders of corps, divisions, and maneuver brigades, and of nuclear capable artillery units, must fight their units and destroy enemy forces. In doing so, they have the responsibility to consider seriously employment of all weapons options, including the employment of nuclear weapons, and to employ those weapons in combat after they have been released by the National Command Authority. Advice on employment, and the actual technical firing of the weapons is the purview of the artillery commander, who is the Fire Support Coordinator for each echelon of command. However, the ultimate responsibility for employing nuclear weapons rests with the maneuver commander to whom the weapons are allocated. The success or failure of nuclear operations will be determined by the ability and willingness of these commanders to plan for the use of these weapons; to know when and how they should be used; and to employ them in the proper manner to accomplish the overall combat mission.

6.1.1 Purpose.

The purpose of this chapter is to share the observations of the authors on the state of preparedness of U.S. Army units and commanders to plan for and employ tactical nuclear weapons; to identify the perceived problem areas associated therewith; and to suggest remedies to the perceived problems through formal and informal education and training.

6.1.2 Scope.

This chapter addresses planning and employment of tactical nuclear weapons by forward deployed or contingency forces of the U.S. Army. While we recognize that future operations will be joint, and that allied nations will play a large part in determining the appropriateness of use of tactical nuclear weapons, we will concentrate on the capability of Army commanders to carry out this part of their overall combat mission.

6.1.3 Statement Of The Problem.

The problem is basically one of less than adequate proficiency in nuclear weapons planning and employment, due to a low priority assigned to training and practicing this skill. This is caused by negative attitudes long held within the Army, and by competition with conventional weapons programs which have always enjoyed a higher funding and time allocation priority than nuclear weapons.

6.2 OBSERVATIONS.

6.2.1 General.

Within the unclassified context of this current effort, no hard statistical data is available which confirms a deficiency in the ability of commanders in the planning and employment of tactical nuclear weapons. However, our observations and interviews with the people currently charged with that task in active duty units, and with those

charged with training them in the formal school system, indicate there is little formal training of the officer corps in this subject, and that major exercises rarely include substantial nuclear weapons play. From these observations, one can reasonably infer that there is little or no opportunity for the vast majority of commanders and staff officers to become proficient in the planning and employment of tactical nuclear weapons. Yet the proficient employment of nuclear weapons has the potential to dramatically affect the ability of these commanders to operate in the battlefield.

6.2.2 Sources/Methodology.

The observations and perceived problems noted in this report were gleaned from interviews and discussions with representatives of the U.S. Army Field Artillery School (USAFAS), Fort Sill, OK; Department of the Army (ODCSOPS); the U.S. Army Combined Arms Center, Fort Leavenworth, KS; and staff officers of corps and divisions in CONUS and USAREUR. Research also included examination of recent Army documents on the subject of tactical nuclear weapons. The authors' initial point of inquiry was the need for automated assistance in nuclear weapons planning. Both DA-DCSOPS and USAFAS agreed that automated assistance in nuclear planning is important and necessary to keep pace with the current and future AirLand Battle Doctrine. There was also consensus that unless the individuals using the automated system fully understood its capabilities and how to use the output, all such automation would be largely wasted. The cited need is not for training in how to operate a computer; rather, the need is for education in how to make maximum use of nuclear weapons through proper employment planning. This led to further discussions on the state of training and education in the subject.

6.2.3 Observations From The Field.

Observations from interviews and discussions with officers assigned to active Corps and Divisions in CONUS and USAREUR, which are synopsized below, lead us to conclude that U.S. Army commanders are only marginally proficient in planning for and employing tactical nuclear weapons. The reason is simply a lack of education, training, practice, and emphasis on that part of the overall combat mission. In these discussions, we observed:

- (CORPS HEADQUARTERS). Exercises normally end immediately after general release, therefore the units, headquarters, and staffs never practice executing nuclear weapons packages.
- (CORPS HEADQUARTERS). Many times nuclear weapons are not even considered in the planning process because it's too hard and we know we won't do anything with them anyway.
- (DIVISION HEADQUARTERS). Nuclear plans remain in the safe and are not looked at. When it gets to a point that we may want to consider nuclear weapons, the exercises are declared over.
- (DIVISION HEADQUARTERS). Rarely, if ever, do we practice nuclear employment planning in exercises.
- (CORPS AND DIVISION HEADQUARTERS). Because we do not practice or play nuclear weapons to any extent, we are losing our expertise in dealing with problems that need to be considered in planning for and employing nuclear weapons.

From these observations, it appears that major exercises (which constitute both informal training and education, and evaluation of proficiency), at Division, Corps, and Theater level include almost no nuclear play. The exercises usually end with the release of nuclear weapons, and on occasion, the firing of a nuclear weapon, either of which is the traditional signal that the exercise is over and everyone can go home.

6.2.4 Education And Training In Nuclear Weapons Employment.

From a survey of formal education courses for the Army officer corps in planning and employment of nuclear weapons, conducted at schools of the Army's Training and Doctrine Command (TRADOC), we observed that the time allotted to this area of education is minimal. Most education in nuclear weapons is in the form of training on the technical aspects of nuclear weapons employment -- how to assemble, transport, and fire the weapons -- and that is taught mainly to artillery officers at the Field Artillery Officer Advanced Course. Maneuver officers -- those who will be maneuver commanders and staff officers -- receive almost no training in this subject. Yet it is these officers who will plan for and employ these weapons. These officers will determine the how, when, and why of nuclear weapons employment, and must consider the immediate impact on enemy and friendly forces, and the long term effects on mission accomplishment.

The lack of emphasis on nuclear weapons employment was recognized in the TRADOC community with the publication of a revised version of the Nuclear Integration Action Plan by the Combined Arms Center on 23 July 1986. The plan dealt with nuclear weapons employment deficiencies in the school system in the areas of doctrine, training, and equipment. The plan made many recommendations for improvement in each area. However, according to representatives at USAFAS, implementation has been limited due to competition for funding and academic hours required to adequately cover the subject in TRADOC schools.

6.2.4.1 Formal. Formal education and training in the Army is the responsibility of TRADOC, which, as of the date of this report, operates three levels of schooling.

- **Branch Schools.** These schools, collocated with their respective branch centers, teach skills peculiar to a specific branch, e.g., Armor, Transportation, Field Artillery, etc. Officers are taught entry-level and advanced branch-specific skills that enable them to perform company grade level duties in their respective branches. The Field Artillery School at Fort Sill, OK, is the proponent for developing the standards and teaching the skills associated with nuclear weapons employment.

(NOTE: This may be the fatal flaw in the whole system. While the field artillery should be the proponent for the technical aspects of firing nuclear weapons, the maneuver commander is the ultimate employer of them. As such, the proponentcy should be CAC for employment decision-making. The reason for a lack of proficiency on the part of maneuver commanders may very well be because everyone considers tactical nuclear weapons the artillery's weapons, and therefore, the artillery's problem with which they need not be further concerned.)

Currently, the Field Artillery School offers instruction in nuclear weapons to three broad groups of students: officers attending the Field Artillery Officer Advanced

Course (FAOAC); students attending the Nuclear and Chemical Target Analysis Course; and students taking that same course by correspondence.

-- FAOAC: This is a twenty-week course which teaches the company grade officer the skills needed to perform successfully as a Battery Commander, Brigade Fire Support Officer, or FA Battalion Staff Officer. A two-week portion of this instruction involves instruction in the techniques and procedures of nuclear and chemical target analysis; weapon/target match, preclusion of damage, damage assessment, non-standard conditions of weapons employment, etc. Award of Additional Skill Identifier 5H (Target Analyst) follows completion. This instruction is technical in nature, and yet is the only nuclear weapons training given in FAOAC. Interviews with subject matter experts at the Field Artillery School indicate that neither additional instruction is given nor practical exercises conducted which deal with nuclear weapons employment.

-- Nuclear and Chemical Target Analysis course (Resident and Non-Resident): This three week course is for those officers who do not attend FAOAC; the instruction is virtually identical. As with FAOAC, the course does not contain instruction on operational employment of tactical nuclear weapons. (The only other branch school providing instruction in nuclear and chemical target analysis is the Chemical School at Fort McClellan, AL.)

- Combined Arms and Services Staff School (CAS³). This 12 week course, conducted in residence at Fort Leavenworth, KS, concentrates students in small groups for the purpose of teaching problem solving and staff procedures. The course contains no material that deals with nuclear weapons.

- Command and General Staff College. The ten-month Command and General Staff course, conducted in resident and non-resident versions at Fort Leavenworth, KS, provides mid-grade (O-4, O-5) officers with skills necessary to serve as a staff officer at division and higher level staffs. Instruction is "branch immaterial"; technical skills peculiar to a particular branch are not taught. Several blocks of instruction deal with nuclear weapons:

-- A396: This course includes emphasis on nuclear operations. It contains a dedicated three-hour seminar on tactical nuclear operations to include offensive/defense considerations and threat nuclear options. It also includes corps level nuclear package planning and considerations of nuclear effects on maneuver and sustainment during a nine-hour practical exercise on encirclement and reduction of enemy forces.

-- A354: A thirty-hour course on nuclear weapons employment offered as an elective during the second and third terms of CGSC. It includes targeting, package planning, logistics, effects, and threat. It is limited to 20-25 students per term, or a maximum of 50 per year. (The typical CGSC course student load is in excess of 1000; therefore at most, only 5% of the students are offered this course).

-- SC52: This is a three week specialized course for officers in specialty code 52, Nuclear Weapons Officer. The Survivability and Integrated Warfare

Directorate of the Combined Arms Combat Development Activity (CACDA) sponsors this course. The Combined Arms and Tactics Department of CGSC teaches a 30 hour block on nuclear package planning, including a practical exercise on division operations with nuclear weapons.

- **Senior Service College.** This level of schooling prepares officers (grade O-5, O-6) for senior leadership in the Army, Defense, and related departments and agencies through professional education on Army and Defense management, and national security affairs. Emphasis is on the development and employment of military forces in land warfare. The resident course lasts 44 weeks. No instruction is presented on staffing procedures at the tactical or operational levels, nor is any technical instruction provided on nuclear or chemical weapons targeting.

- **Summary.** The TRADOC formal school system currently provides the opportunity for selected officers to learn only the technical aspects of nuclear and chemical target analysis. Little or no formal instruction is provided which integrates the technical aspects of nuclear weapons employment with its operational aspects. Responsibility for the development of this skill is left to the informal method of training and education -- learning by doing associated with field and staff exercises conducted by operational units.

6.2.4.2 Informal. Informal education and training of the officer corps takes place in units and through participation in unit and larger exercises.

- **Unit training.**

- **ARTEP.** Unit training in U.S. Army units is governed by the Army Training and Evaluation Program (ARTEP) for each unit of company (battery) and battalion size. These documents prescribe the tasks the unit must perform, the conditions under which they must perform them, and the standards which they must meet in performing the tasks. Planning and employment (including delivery) of tactical nuclear weapons are included in the field artillery unit ARTEPs. A sampling of maneuver unit ARTEPs indicates that nuclear related tasks are limited to securing Atomic Demolition Munitions, and operating in an NBC environment.

- **OJT (On-the-job training).** With high personnel turbulence in most units, much of the individual training conducted in units is OJT. For the planners of nuclear weapons employment, training is mostly limited to participation in exercises. OJT is also used extensively in field artillery units. Because of the importance placed on the proper handling of things associated with nuclear weapons (EMAS/NRAS, PAL, etc), most nuclear capable unit commanders dedicate soldiers exclusively to those positions. These soldiers are proficient in the technical aspects of nuclear weapons employment. Aside from theater schools (e.g., Nuclear Weapons Courses at The NATO School (SHAPE) in Oberammergau, Germany), most of this technical training is passed on from one person to another, as one replaces the other in the job.

- **Major exercises.** NATO conducts the only two major nuclear exercises, the biennial WINTEX, and the annual Able Archer. Both of these are very high level CPXs, and do not involve lower echelons (corps, division) to any great extent. Conventional

exercises conducted in NATO, and in CONUS units with NATO contingencies, are not integrated, and provide little training in nuclear weapons employment. Although exercises appear to be the only informal training that U.S. Army officers get, the current ones do not provide training sufficient for proficiency on a continuing basis, as evidenced in the comments of officers in paragraph 2C, above. (For a complete discussion of the history and current status of exercises regarding nuclear weapons, see Sandia Report SAND89-1580-RS9011/89/00028, "An Overview of NATO Nuclear Policy, Planning, and Exercises" (U), a SECRET report by Douglas B. Larson and Garry S. Brown, published by Sandia National Laboratories, Albuquerque, NM and Livermore, CA, in August, 1989, copies of which have been furnished to DNA.)

- Summary. The unit training and exercise system has the potential to offer the commanders and staff officers who will employ nuclear weapons, if they are ever employed, the opportunity to become proficient in this task. Currently, it appears that this opportunity is not great, and that the majority of time and effort is dedicated to attaining proficiency in conventional operations.

6.2.5 Attitudes About Nuclear Weapons.

6.2.5.1 NATO Follow-on Forces Attack (FOFA). The rationale for acquiring, maintaining, and possessing the capability to employ tactical nuclear weapons has always been the capability of the threat (Warsaw Pact) to overwhelm NATO forces by virtue of sheer numbers of conventional combat vehicles, artillery, and aircraft. New Technology for NATO, a book prepared by the US Congress Office of Technology Assessment in 1987, explains how NATO is implementing their strategy of Follow-on Forces Attack (which the U.S. Army AirLand Battle doctrine calls Deep Attack or Deep Battle). The foreword by the office's director, John H. Gibbons, sums up the basic attitude of NATO on nuclear weapons:

"The North Atlantic Treaty Organization (NATO) has been wrestling with a fundamental dilemma: how, within the confines of a strategy constrained by politics and geography, to maintain deterrence against the numerically superior and increasingly technically sophisticated forces of the Warsaw Pact. Nuclear weapons underpin NATO's deterrent, but Alliance military planners are uncomfortable with the prospect of a conventional defense that could be overwhelmed so rapidly as to require early resort to nuclear weapons."

Chapter 1, Principal Findings, begins:

"NATO has adopted its Follow-On Forces Attack (FOFA) concept as part of its program to counter a growing Warsaw Pact conventional threat, and thus to avoid either an early resort to nuclear weapons or even a collapse so rapid as to preclude escalation to nuclear weapons. ... Early in its history, NATO decided to rely on both conventional and nuclear weapons because it could not afford a completely conventional defense."

However, with the FOFA doctrine, there is an attempt by NATO leaders to do all they can NOT to use nuclear weapons at all, or at least, not early in the fight, as they have planned to do in the past. This is reinforced by the attitude of the Federal Republic of Germany and many other countries who vigorously oppose modernization of nuclear weapons, because if they are used in a NATO war, they will be used on their soil.

6.2.5.2 U.S. Army Tactical Modernization in Jeopardy. As a result, several programs for modernizing nuclear weapons are suffering from a lack of support and funding.

- **Artillery Fired Atomic Projectiles (AFAPS).** Programs for improvement of Artillery Fired Atomic Projectiles are in jeopardy, due to the attitude of NATO allies against employment of tactical nuclear weapons on Western European soil.

- **Follow-on to Lance (FOTL).** Similarly, the program to replace the aging LANCE missile by 1995, Follow-on To Lance, suffers from the same attitudinal opposition. Decisions on fielding FOTL have been postponed until 1992, after the elections in the Federal Republic of Germany.

- **Field Artillery in General.** The Field Artillery has had to absorb several major funding reductions in the last few years. With the current attitudes emphasizing conventional weapons, they will most likely be funded over any improvements in tactical nuclear weapons (AFAPS, FOTL).

- **Emphasis on Smart Munitions.** Another reality in today's R&D world that mitigates against nuclear weapons is the emphasis that has been placed on "smart" munitions. The argument is that because we will soon have precision attack capability at artillery cannon, rocket, and missile ranges, we do not need tactical nuclear weapons.

6.2.5.3 Era of Glasnost, Peristroyka and Arms Reduction. Since the end of World War II, the Soviet Union has been seen by the United States as "the threat", characterized by a desire for world domination, and poised to overrun Western Europe by force in a massive artillery and armor attack. Arms reduction talks have been on-going for decades, but have concentrated on strategic arms, and not on tactical nuclear weapons or conventional forces. With the rise of Mr. Gorbachev to the presidency of the Soviet Union in 1985, and his subsequent declaration of "glasnost" (openness) and "peristroyka" (rebuilding), arms reductions have become a reality.

- **INF Treaty.** The Intermediate-Range Nuclear Forces Treaty, signed in 1988 by the US and USSR, did away with intermediate-range nuclear weapons in Europe. Although there have been reductions in weapons stocks in the past, this mutual reduction is seen by some as the beginning of elimination of nuclear weapons from Europe.

- **Talks in progress.** The Strategic Arms Reduction Talks (START) in Geneva, and the Conventional Forces Europe (CFE) talks in Vienna are both in progress, and

have goals aimed at reducing strategic and conventional forces in NATO and the Warsaw Pact.

• **Political Changes in Eastern Europe and perceptions of diminished threat to NATO.** The fall of several communist regimes and the calls for freedom and democracy in Eastern Europe have weakened the resolve and strength of the Warsaw Pact as a military force. The threat is no longer seen in the same way, and substantial troop reductions on both sides have been proposed. The events of late 1989 have had a profound effect on military planning. The threat is considered diminished, but a revised scenario has yet to be devised, and probably won't be for some time, until the current talks and presidential force reduction proposals are evaluated on both sides. The current climate of "peace breaking out all over" further reduces the perception of importance that Army field commanders have the skills required to effectively and properly employ nuclear weapons on the battlefield.

6.3 CONCLUSIONS.

6.3.1 Low Priority - Perceived Low Utility.

The lack of education and training in planning and employment of tactical nuclear weapons in the Army stems from the negative attitude toward those weapons that has prevailed since their introduction into the inventory in the 1950s. The attitude of national leaders and senior military officials, in the United States and in allied nations, that nuclear weapons are purely deterrent and that their employment as a "weapon of last resort" results in a low priority for improving the capability to employ tactical nuclear weapons.

6.3.2 Formal Education Lacking.

Formal education and training in service schools offers minimal proficiency in TNW planning and employment. While this has been recognized in the Nuclear Integration Action Plan (NIAP) of July, 1986, it appears that little has been done to fully implement the recommendations to correct the deficiencies in nuclear weapons training and education noted in that plan. Continued budget cuts and changing educational requirements in conventional warfare will most likely preclude additional instruction in TNW.

6.3.3 Informal Training Not Integrated.

Informal training in units likewise emphasizes conventional operations, with few requirements for tactical nuclear weapons proficiency outside of the technical aspects demanded of nuclear-capable artillery units. Major exercises do not integrate conventional and nuclear weapons, but treat each separately in separate exercises, so that the capability to plan for and employ these weapons is rarely practiced to the extent that would ensure proficiency in their use.

6.3.4 Allies Generally Opposed To Use.

Allied attitudes opposing employment of the weapons in Europe, where the primary threat to be countered by tactical nuclear weapons exists, adversely impacts training in planning and simulated employment of tactical nuclear weapons.

6.4 RECOMMENDATIONS.

6.4.1 Develop Positive Nuclear Weapons Doctrine.

If tactical nuclear weapons are to remain in the Army inventory as a potential counter to a postulated threat that may require their use, Army doctrine should leave no doubt that the planning and employment of TNW must be integrated into the overall concept of operations and scheme of maneuver.

6.4.2 Improve Formal Education And Training.

To the extent possible, the positive actions to increase proficiency in planning and employment of tactical nuclear weapons outlined in the NIAP should be implemented within the service school system. Since attitudinal change is a necessary part of this education, seminars on the subject of tactical nuclear weapons employment should be a part of each major course. Lectures dealing with the technical aspects of TNW employment are needed, but they are not as important initially as seminars which require resident students to form their own opinions about TNW, and to understand the relationship between maintaining the weapons as a deterrent and the potential for actual employment. This can be accomplished only in seminar form, with the objective of understanding the many aspects of TNW, under the doctrinal umbrella of integrated conventional and nuclear weapons on the future battlefield. The extent to which this can be implemented is directly proportional to the degree of seriousness that the Army gives to the need for proficiency in the planning and employment of tactical nuclear weapons.

The implementation of automation through the Army Tactical Command and Control System offers an additional opportunity for training in TNW. The system described in the main portion of this report, which will integrate TNW planning and employment into the Advanced Field Artillery Tactical Data System (AFATDS), has the potential to contribute to attitudinal change as well as technical proficiency. "Hands-on" training with AFATDS in a well planned, integrated exercise, can provide prompts that make TNW planning a matter of course as opposed to a separate action. The objective is to have the student leave the course with an attitude that TNW planning is the norm, and that one would no more leave it out of a fire support plan than he would leave out the assignment of tactical missions to units. Automation of the fire support planning function puts TNW planning in the normal sequence of events.

6.4.3 Improve Informal Education And Training.

Changes in doctrine and instruction set the stage for attitudinal change and increased proficiency in TNW operations. These are reinforced by daily operations in units, particularly during exercises, and have the most long-lasting effect on the attitudes of those officers who have the responsibility for making TNW a viable and reliable part of the commander's overall warfighting capability.

6.4.3.1 Unit Training Programs. Revisions to ARTEPs will stem from doctrinal development of a viable integration of conventional and tactical nuclear weapons on the future battlefield and will reflect the degree of seriousness which the Army gives to TNW planning and employment. Revisions should include tasks for the commanders and staff officers of each unit having direct responsibility for TNW planning and employment, as well as some tasks for operating in a tactical nuclear environment.

6.4.3.2 Exercises. Due to the political nature of NATO exercises, changes in major NATO exercises may not be feasible. However, commanders conducting U.S. Army exercises, and certain joint exercises, may be amenable to modifications in the scenarios and event lists which increase the training in tactical nuclear weapons planning and employment.

- **Early Release.** Although it is standard procedure for a major commander to request nuclear release at some reasonable point in the sequence of an exercise, the release is normally granted at the end of the exercise. This traditional timing precludes training for maneuver operations because it terminates the exercise before the continuous and changing planning requirements associated with tactical nuclear weapons employment can take place. General or selective release should be given to commanders on some exercises early in the exercise, so that the plans can be executed, changed as required, and operations conducted in a nuclear environment.

- **Integrated Operations.** Early release of nuclear weapons for employment in a tactical situation in some exercises would create a situation wherein the commander and his entire staff would have to revise their estimates, and continuously plan and employ tactical nuclear weapons over a period of several days. It would force the integration of conventional and nuclear planning and operations. It is in the area of integrated operations that the automated system for tactical nuclear weapons planning has the potential for its greatest contribution. AFATDS will be the vehicle for ensuring total control of the fire support function on the future AirLand Battlefield. It has not yet been fielded, but will be in the next few years, as part of the Army Tactical Command and Control System (ATCCS). Full integration of the nuclear planning functions into AFATDS will make nuclear planning routine and force the users to consider this viable option for fire support.

6.4.3.3 Increase Awareness. Army commanders and staff officers are often caught up in the "tyranny of the moment", and the emphasis on conventional warfare takes up most of their waking hours. Internal Army actions outlined above should be a matter of command emphasis, and publicity. Additionally, sponsorship of discussions, conferences, and seminars in the defense community has the potential to sow the seeds of attitudinal change among attendees, who may spread the word in their units.

- **The American Defense Preparedness Association (ADPA).** This organization sponsors symposia on various topics of interest to the military, and enjoys high credibility because of the participation of experts and high level officials in their discussions. ADPA should be asked to sponsor a series of symposia on the subject of tactical nuclear weapons, preceded as always by a call for papers, which generate interest and set the stage for discussions. Awareness can be further increased by publication of symposia summaries in their monthly publication, National Defense.

- **The Association of the United States Army. (AUSA).** One of the strengths of this organization is their publication of papers on subjects of interest to the leadership of the Army. The publications are available to all members of the association on request, but are sent to all general officers, and to congressional members and staffers. Reference to the papers could be made in their monthly publication, Army

Magazine. AUSA should be requested to prepare a series of papers on the realistic employment of tactical nuclear weapons.

- Articles in major defense and academic publications. Interviews with top Army and DOD officials on the subject of tactical nuclear planning in such media as Defense News, Armed Forces Journal, and Military Review, would have a positive reinforcing impact on attitudinal change among the officer corps. Current scholarly defense research, dealing with the current political realities and continued presence of nuclear weapons in the arsenals of nations, should be analyzed for implications on the Army's plans for inclusion of tactical nuclear weapons in worldwide contingencies.

6.5 AFTERWORD.

If tactical nuclear weapons are still considered a viable option for the AirLand Battlefield of today and tomorrow, then the proficiency in planning for and employing them should have the same priority as the latest conventional weapons. That is not the case in today's Army. Attitudes can be changed. One of the greatest proofs of that is in the field of automation. People who had attitudes of extreme bias against "computers" have learned to use and master them, once they understood what this new technology could do for them in the daily accomplishment of their tasks. Battlefield computers are now facing the same challenge, and the fielding of ATCCS will be a watershed for automation in the Army. The inclusion of nuclear weapons employment planning in this new automated system is a vehicle for the renewing of training and education for maneuver commanders and staff officers who will have to plan for the use of nuclear weapons. Whether in the classroom, in their units, or on major exercises, ATCCS will be with the officers as they train. Making nuclear weapons employment planning an integral part of that system has the potential for increasing the proficiency of the users to the degree they must have to fulfill their responsibilities.

SECTION 7

RECOMMENDATIONS

7.1 GENERAL.

The deliverables presented in compliance with this Phase II SBIR contract can prove useful to the Army in several ways. In addition to enabling the logical selection of the nuclear employment planning functions which should be automated in the ATCCS, the deliverables provide payoffs in the areas of training and doctrinal developments. The following paragraphs recommend several means for making maximum use of the products of the contract.

7.2 ATCCS DEVELOPMENT.

From the outset the A-type specification resulting from this contract was intended to provide the basis for integrating nuclear weapons employment planning into the ATCCS. The Functional Description, Data Flow Diagrams, and Data Dictionary provide this basis. In order that nuclear employment functions be considered as the Army develops an automated command and control system, we recommend that copies of this report and its appendices be provided to the Director, TRADOC Program Integration Office (TPIO), ATCCS. We believe that as the overall integrator of the ATCCS effort within the user community, the TPIO, ATCCS should take the following actions:

- Provide copies of the Final Report, Functional Description, Data Dictionary, Data Flow Diagrams, and Mission Thread Diagrams to each of the four affected BFAs: Maneuver Control, Fire Support, Intelligence/EW, Combat Service Support.
- Direct that the BFAs review the nuclear employment planning functions in their respective areas to determine those which should be automated within their respective ATCCS control system (e.g. AFATDS, ASAS, etc.). Such a review will serve to determine which automated functions can be supported in each respective BFA control system.
- Monitor the results of the BFA review and ensure that appropriate interfaces between BFAs exist in the selection of nuclear employment planning functions for automation. Because of the staff interaction required for nuclear employment planning at corps and division levels, many of the functions will be candidates for automation on the Force Level Control System (FLICS) software to be resident in the BFA automated control systems beginning in the mid 1990's.

7.3 TRAINING AND DOCTRINE DEVELOPMENT.

In addition to providing the basis for nuclear weapons employment planning within the ATCCS, the deliverables of this contract can be useful in the areas of training development and doctrine development. We recommend that copies of this report and its appendices be provided to the Chief, Battlefield Nuclear Weapons Division, Concepts and Force Alternatives Directorate, Combined Arms Combat Developments Activity, Fort Leavenworth, Kansas. We recommend that as the Army's doctrinal focal

point for operational aspects of tactical nuclear weapon employment, the Chief, BNW Division:

- Use the products of this contract in developing and refining planning decision aids. The Functional Description along with the Mission Thread Diagrams define the nuclear planning requirements and sequences for the corps and division commander and staff. These documents can provide both structure and depth to existing nuclear employment planning aids and will help to clarify and encourage appropriate nuclear planning as a matter of routine at corps and division echelons.

- Use the products of the contract during revisions to doctrinal publications covering nuclear employment planning. The BNW Division is responsible for updates and revisions to FM 100-30, Nuclear Operations in Support of AirLand Battle, which is a key nuclear weapons doctrinal publication for corps and subordinate commanders. The Nuclear Weapons Employment Planning Functional Description, Mission Thread Diagrams, and Commander's Guidance products will assist in refining the nuclear planning portions of FM 100-30. We further recommend that the BNW Division forward copies of these three deliverables to those TRADOC Schools, such as the Field Artillery School (FM 6-20-30) and the Missile and Munitions School (FM 9-84), that produce manuals which address nuclear employment planning from various functional area perspectives.

SECTION 8

LIST OF REFERENCES

- FM 3-100. NBC Operations, 17 September 1985.
- FM 6-20-30. Tactics, Techniques, And Procedures For Fire Support For Corps And Division Operations (Final Draft), 1 February 1989.
- FM 11-50. Combat Communications Within The Division, 31 March 1977.
- FM 24-22. Communications-Electronics Management System, 30 June 1977.
- FM 34-1. Intelligence And Electronic Warfare Operations, July 1987.
- FM 71-100. Division Operations (Approved Final Draft), 15 Nov 1988.
- FM 100-15. Corps Operations (Approved Final Draft), 15 Nov 1988.
- FM 100-30. Nuclear Operations in Support of Airland Battle, 1 Aug 1989
- FM 101-5. Staff Organization And Operations, May 1984.
- FM 101-31-1. Nuclear Weapons Employment Doctrine And Procedures, January 1986.
- FC 100-15-1. Corps Deep Operations, 30 June 1985.
- FC 101-5-2. Staff Officers' Handbook, March 1987.
- AR 105-31. Record Communicatons, 15 November 1984.
- Army Command And Control Evaluation System, prepared for ARI Field Unit, Fort Leavenworth, KS, by Defense Systems, Inc., 8 October 1987.
- Army Command And Control Master Plan, Volume I, "Concepts and Management", October 1987.
- Functional Definition Of The Army Tactical Command And Control System (ATCCS), prepared for C3I Directorate, US Army CACDA, Fort Leavenworth, KS, by Magnavox Electronic Systems Company, June 1988.
- TRADOC Pamphlet 11-9. Blueprint Of The Battlefield, 8 July 1988.
- USACGSC Student Text 100-9. The Command Estimate, July 1987.

APPENDIX A
STATEMENT OF WORK
for
OPERATIONAL NUCLEAR EMPLOYMENT PLANNING
DEFENSE NUCLEAR AGENCY
DNA001-88-C-0068

TASK 1: Identify and document operational nuclear planning functions for ATCCS.

TASK 1a: Update the Phase One work to determine the doctrinal publications that govern nuclear planning.

TASK 1b: Determine the nuclear planning functions that exist in the battlefield functional areas of Maneuver (MCS), Fire Support (FS), Intelligence/Electronic Warfare (IEW), and Logistics (CSS) and at what echelon of command.

TASK 1c: Recommend who should be the doctrinal proponent for nuclear planning functions as determined in Task 1b.

TASK 2: Perform a functional requirements analysis after establishing what functions are applicable to MCS, FS, IEW, and CSS.

TASK 2a: Examine the MCS, FS, and IEW functions identified in Task 1 and develop the following: (1) level of decomposition required for each function; (2) the inputs, processes and outputs at each hierarchical structural level for each function/subfunction; and (3) a reasonable preliminary man-machine allocations for each identified function. The product of this effort will be an "A" type specification to be included as an appendix to the final report.

TASK 2b: Evaluate the CSS functions determined in Task 1 and provide a limited level of decomposition and input/process/output hierarchical structure for each function as directed by DNA.

TASK 3: Determine the elements of commander's guidance as they apply to the planning for the use of nuclear weapons. This effort will entail a determination of the following: (1) What is commander's guidance? (2) What is commander's guidance as it applies to operational nuclear planning prior to and after nuclear release? (3) Who has the authority to establish or change guidance? (4) What is commander's guidance as pertains to defeat criteria? (5) What is commander's guidance as it applies to limiting requirements? and (6) What is commander's guidance as it applies to allocating weapons?

TASK 4: Management and Technical Review. This project involves DNA, CACDA, the Artillery School, MCS, CSS, and IEW program offices as well as the contractor. In order to ensure the success of this project, technical and management review shall be necessary.

APPENDIX B TRIP REPORTS

SUBJECT: Trip Report

DATE: 14-15 December 1988

PLACE: CACDA, Fort Leavenworth, KS

PARTICIPANTS: COL Steve Kempf, Dir, Concepts and Force
Alternatives Directorate
LTC Dave Cassel, Ch, Battlefield Nuclear Warfare (BNW)
Dick Wright, BNW
MAJ Steve Rawlick, DNA
Lowry West, LB&M
Don Doerfler, LB&M

1. The purpose of the meeting was to brief CACDA personnel on the DNA project, Operational Nuclear Employment Planning, a Phase II SBIR being done by LB&M Associates, Lawton, OK. In addition to the briefing LB&M wanted to request assistance from BNW in obtaining certain reference materials needed to fulfill contract requirements.
2. LTC Cassel explained that a new FM 100-30 is in for final review and should be sent to the printers shortly. A new FM 100-50 has just been released and he would see that one was provided to LB&M. He also said that Dick Wright was in the process of writing/rewriting FM 50-13 Nuclear Training.
3. BNW will be LB&M's point of contact at CACDA for this project. Work being done during the contract will be forwarded to BNW periodically for reality checks.
4. CACDA personnel were enthusiastic about the project and saw it as something that was long overdue in being done.

D W Doerfler
PM, LB&M

8 February 1989

SUBJECT: Trip Report, Coordination Meeting, DNA-CAC-LB&M

CONTRACT: Operational Nuclear Employment Planning (DNA, Phase II SBIR)

DATE: 7 February 1989, 1105-1220 hours.

LOCATION: CACDA, Fort Leavenworth, KS

PARTICIPANTS: LTC D. Cassel, CFAD, CACDA
MAJ S. Rawlick, DNA
MAJ A. Jeffrey, CFAD, CACDA
Mr. D. Wright, CFAD, CACDA
Mr. L. West, LB&M Associates

SUMMARY:

1. Purpose. The purpose of the meeting was to allow LB&M Associates to present the draft third-level functional definition of nuclear employment planning functions to representatives of DNA and CACDA in order to gain concurrence and/or guidance on the general direction of the functional description.

2. Discussion: Points.

a. Mr. West presented each participant with a copy of the draft third-level functional description and explained that the top-level functions were derived from the Army Command and Control Master Plan (AC2MP). Mr. West also showed the participants examples of the data distribution diagrams and data dictionary developed using the ANATool software application.

b. Mr. Wright asked for an explanation on how information could be provided to LB&M under the contract. MAJ Rawlick explained that LB&M should submit requests through DNA. If information is not available at DNA, DNA will ask CACDA to provide it directly to LB&M.

c. MA Rawlick asked whether only the top-level employment functions had a basis in doctrine. Mr. West responded that all functions down to the third level had been extracted from doctrinal publications.

d. Mr West recommended that after DNA and CACDA comments had been incorporated into the third-level functional definition, coordination and comments be sought from nuclear doctrine experts in fire support (Fort Sill), command and control (CACDA), intelligence (Fort Leavenworth or Fort Huachuca), logistics (Fort Lee), and maneuver control (Fort Leavenworth) as well as USANCA. MAJ Jeffrey suggested that input from OMMCS at Redstone Arsenal might also be of value.

e. The following general comments/suggestions were made by CACDA representatives:

- (1) FM's 71-100 and 100-15 now have nuclear annexes.
- (2) Use FM 6-20-30 as the reference of choice in the area of nuclear employment package development.
- (3) The latest FM 100-50 should be acquired and reviewed.
- (4) Mr. Wright provided LB&M with copies of slides of the nuclear employment briefing given to corps and division staffs undergoing BCTP.

3. Results.

a. MAJ Rawlick stated that he would review the third-level functional description and provide DNA comments.

b. MAJ Jeffrey stated that he and Mr. Wright would review the functional definition and also present it to representatives (fire support, maneuver, logistics, and intelligence) of the Army Tactical Command and Control System (ATCCS) TPIO. Comments will be provided to LB&M in approximately two weeks.

c. Remaining to be resolved is the question of which specific doctrinal proponents should be visited for coordination and comment on the functional description.

SIGNIFICANCE TO CONTRACT: The coordination meeting had the following significance:

1. DNA and CACDA review of the draft third-level functional description will ensure that LB&M efforts are headed in the right direction.
2. Presentation of the draft functional definition to the ATCCS TPIO will facilitate future discussions with that office on the form and substance of nuclear employment functionality within the ATCCS.
3. The meeting provided DNA, as well as CACDA representatives, with the current status of LB&M's work on Task 1.

Lowry West
Systems Analyst

April 25, 1989

MEMORANDUM FOR RECORD

SUBJECT: Minutes of IPR

1. An In Progress Review was held at the Defense Nuclear Agency A) on April 24, 1989, from 0915 to 1230. The purpose of the meeting was to inform selected DNA personnel of the status/progress of contract # DNA 001-88-C-0068, Operational Nuclear Employment Planning, a Phase II SBIR. A list of attendees is attached.

2. Donald Doerfler, LB&M, presented an overview of the project, to include a discussion of the Phase I conclusions, work needed to be accomplished during the Phase II, milestones and resources. Lowry West, LB&M, presented a detailed discussion of the work accomplished to date. He presented the methodology LB&M is using in identifying nuclear planning functions and in decomposing those functions. Mr. West also presented examples of the functional decomposition, related inputs and outputs, locations where processes are performed, and identification of the processors. In addition, some examples of mission threads, data dictionary entries, and tree charts for selected functions were shown to the attendees to further describe the work being done by the contractor. The lack of data from the user community was addressed at this point as a concern. It was noted that information from the corps in the form of SOPs, would be extremely useful. To date LB&M has not been able to obtain these data sources.

3. A lengthy discussion about the April 11, 1989 letter from CAC subject: "Nuclear Command and Control Automation Project by LB&M Associates" was held between LB&M representatives and DNA. (No one from CAC was present at the IPR). It was agreed that the letter probably stated reality as to the current status of C2 automation development, but still left questions that needed to be answered in order to make the deliverable a useful document to the user (Army). LB&M is to draft a response to the CAC letter and forward it to DNA for "word-smithing" and signature. The letter will request CACDA send LB&M the functional descriptions for the BFAs and the C2 master plan, adding that LB&M will structure their work to fit those guidelines if it does not already.

4. The CAC letter of April 11 also contained comments on the third level functional description presented to CAC & DNA representatives by Mr. West on February 6, 1989. The comments provided in the CAC letter were few in number and have already been incorporated into LB&M's functional description. CAC apparently accepts the basic framework of the description. It was agreed that visits to BFA functional proponents were desirable and necessary to add credibility to the work.

5. A discussion of ATCCS and its development was held in order to familiarize the DNA attendees with the ATCCS.

6. A brief discussion of follow-on work was held with Major Rawlick and LTC Ben Moberley. LB&M proposed three ideas for consideration--a) a similar effort for

chemical planning as is currently being done for nuclear planning, b) look at the training aspects of simulations using CATIES and c) something for nuclear planners to more realistically plan for and wage a simulated nuclear war. It was also suggested that DNA might encourage further work by CECOM in continuing the system design.

7. Copies of briefing slides were left with each attendee.

8. No new milestone dates were established.

Donald W. Doerfler
PM

IPR ATTENDEES

COL E. Chase	DNA
LTC G. Driscoll	DNA
MAJ A. Providakes	DNA
LTC B. Moberly	DNA
MAJ S. Rawlick	DNA
Mr. L. West	LB&M
Mr. D. Doerfler	LB&M

SUBJECT: Trip Report

DATE: 27 September 1989

PLACE: CACDA, FT. Leavenworth, KS

PARTICIPANTS: MAJ A. Jeffrey, BNW, CACDA
CPT Reichert, BNW, CACDA
MR Dick Wright, BNW, CACDA
MAJ Ed Kaster, CGSC
MR Buck Aldrich, TPIO ATCCS
CPT David Vincent, TSM, MCS
MR John Stucker, C2 P&A
MR D. Doerfler, LB&M
MR L. West, LB&M

1. The purpose of the trip was to brief the participants on the Operational Nuclear Employment Planning project and solicit their input to the functional description document which had been mailed ahead for their review. No one except the BNW personnel had taken any real time to review the document. The CGSC, TPIO ATCCS and C2 representatives had not seen the document until the day of the meeting or not seen it at all. The MCS representative had briefly scanned the document prior to coming to the meeting.

2. Doerfler and West provided a briefing to the assembled participants and ask for any suggestions to be included in the material being developed on nuclear planning. The following are the comments received during the 4 hour meeting:

- Check JCS Pub 25 for Data Element Description (MCS). *This proved to be a bureaucratic nightmare in trying to obtain the document.*

- What connections or hooks are there to EAC systems (C2, P&A)

- Check new AC2MP (C2, P&A) *LB&M already in possession of this document.*

- MCS ROC which is block 3 scheduled for '92 has no specific nuclear planning functions included in the functional description of the system (TSM, MCS). *LB&M has been unable to obtain the MCS ROC or MCS Functional Description.*

- LB&M functional description may be of use in the ALB Management Study (CGSC).

- Consider Air Defense planning in the defense of PNL storage areas (TSM, MCS).

3. This meeting was to give us a start on our visits to the other centers/proponent agencies. The lack of response from the participants is of concern to both DNA & LB&M. TSM, MCS and TPIO ATCCS are or should be key players because of the role each play in the development of ATCCS.

D. W. Doerfler
PM

SUBJECT: Trip Report

DATE: 29 September 1989

PLACE: USA Logistics Center, Ft. Lee, VA

PARTICIPANTS: MR Brian Wood, Data Systems Div (DSD), LOGCEN
CPT Buchanan, DSD, LOGCEN
LTC Holladay, Doctrine Office, LOGCEN
MAJ Steve Rawlick, DNA
MR L. West, LB&M
MR D. Doerfler, LB&M

1. The purpose of the trip was to brief and solicit comments from LOGCEN personnel on the nuclear planning function descriptions developed thus far in the project. Of particular interest to LB&M was the logistics functions that had been included as functions needing to be accomplished by the logisticians when nuclear weapons planning occurred.

2. The following comments were provided by the participants from the LOGCEN:

- It appears that CSS has already considered 80% of what we described. *This comment gave DNA & LB&M a good feeling about the work already accomplished.*

- DSD was concerned about system response time. In other words don't slow my system down by adding a lot of new functions. They suggested looking at JCS Pub 19.

- Consider area damage control planning (DOC).

- Indicate difference between corps and division planning functions.

- DSD was very concerned about classification of the system as a result of the LB&M work. They (LOGCEN) were already forced into at least secret and did not like the implication of nuclear planning forcing them to something higher. LB&M and DNA assured them it was not our intent to force the system to any higher classification.

- Look at AR 25-9 for data element description (DSD). *DNA is to look into obtaining a copy.*

3. This was a very positive and upbeat meeting, especially after CAC. The LOGCEN personnel were extremely helpful and both Wood and Buchanan had spent considerable time reviewing the read ahead material provided. They indicated we were definitely on the right track and could offer no major suggestions for our planned approach to the project. The CSSCS ROC does not address things nuclear. LTC Holladay was going to send a message to TRADOC requesting clarification.

D. W. Doerfler
PM, LB&M

SUBJECT: Trip Report

DATE: 3 October 1989

PLACE: USA Ordnance Missile & Munitions Center, Redstone Arsenal, AL

PARTICIPANTS: MR Bill Green, Concepts and Studies
MR Ray Watkins, ATSK-CCU
CW4 Steve McCreary, ATSK-MS
CW3 Haskel McLane
CW4 Johnnie Walters, ATSK
MAJ Steve Rawlick, DNA
MR L. West, LB&M
DR D. Sullivan, LB&M
MR D Doerfler, LB&M

1. See attached report from Dr. Sullivan.
2. OMMCS provided new copies of FM 9-84 and 9-6.
3. Mr Green suggested we look at FM 25-50 Corps & Division Nuclear Training. It is out in a coordinating draft.

D. W. Doerfler
PM

Subject: Coordination Visit, OMMCS, 2 October 1989

1. On 2 October 1989, Messrs. Don Doerfler, Lowry West, and Don Sullivan of LB&M Associates, Inc, accompanied by Major Steve Rawlick, Contracting Officer's Representative, of the Defense Nuclear Agency, visited the Ordnance Missile and Munitions Center and School (OMMCS) at Redstone Arsenal, Alabama. The purpose of the visit was to obtain comments and feedback from the nuclear ammunition supply subject matter experts (SME) at OMMCS regarding the flow of information, data, and procedures outlined in the LB&M-prepared draft corps-level nuclear planning Decision Support System (DSS) documentation as the DSS relates to nuclear ammunition resupply. This visit was preceded by extensive coordination through the TRADOC proponent office at CAC. OMMCS had received advanced copies of the draft DSS, together with a letter explaining the purpose of the visit, in sufficient time for review prior to the visit.

2. In attendance at the meeting from OMMCS were Mr. Bill Green, Nuclear Ammunition Branch Chief; CW4 Walters who had previously been the CENTAG NWLE; CW4 McCreary, lead nuclear ammunition instructor at OMMCS; and CW3 McLean, automated ammunition resupply systems.

3. Messrs. Doerfler and West presented the approach and documentation process to the OMMCS SMEs and solicited comments. Comments from members of the group included the following:

3.1 There are significant automated nuclear planning systems on the ground in Europe at the theater army level. There is a need for an automated planning system at the corps and it is important that these systems interface.

3.2 It appears that the documentation presented for this corps-level system is better than the documentation on which the theater system was developed.

3.3 There should be automated "hooks" from higher headquarters to corps planners--both up and down. Interface between the existing theater system and this emerging corps-level system is critical.

3.4 There must always be a manual backup to any automated system so that nuclear ammo resupply does not "break" if the automated system is degraded, jammed, etc.

3.5 From the logistical perspective, emergency action processing is important. There is a need for automation of emergency action messages.

3.6 Care must be taken to limit or otherwise handle the number of inputs to the system, otherwise, system response time may be degraded to an unacceptable degree.

3.7 The relationship of the the Special Weapons Inventory Management System (SWIMS) to this effort should be determined.

3.8 One of the issues which should be considered in further development, and explored in Europe, are the differences in specific procedures which may be slightly out of line or supplementary to doctrinally determined procedures.

4. The general consensus of the OMMCS review group was that the draft DSS accurately reflects Army doctrine and that it appears to be an excellent laydown of the various linkages and relationships which exist in the nuclear ammunition resupply arena. In summary, the representatives at the OMMCS concurred with the approach and the detailed laydown of the draft DSS system and supported its continued development.

B. Don Sullivan, PhD

SUBJECT: Trip Report

DATE: 4 October 1989

PLACE: USA Signal Center and School, Ft Gordon, GA

PARTICIPANTS: LTC Sewell, DCD, MSD
CPT J. Blaine, DCD, MSD
MR Tom Carpenter, DCD, MSD
MR Bill Webber, DCD, MSD
CPT Rich Lajoie, DCD, MSD
CPT Bill Wadley, TSM, MFC
MAJ Steve Rawlick, DNA
MR L. West, LB&M
MR D. Doerfler, LB&M

1. The purpose of the trip was to brief personnel from the SIGCEN about the project and solicit comments from them concerning the read ahead material (Nuclear Planning Functions Descriptions).
2. The personnel at the meeting were not sure what was expected from them based on the letter provided by CACDA with the read ahead material. They will now look at the functional descriptions with an eye to critique and comment on the information management function. Will provide comments by 1 November 1989.
3. SIGCEN has Information Management oversight responsibility, but are not themselves information managers.

D. W. Doerfler
PM

SUBJECT: Trip Report

DATE: 5 October 1989

PLACE: Defense Nuclear Agency, Alexandria, VA

PARTICIPANTS: COL Glowski, Ch NANF
LTC B. Moberly, Dep Ch NANF
MAJ S. Rawlick
MAJ E. Nobles
MR L. West, LB&M
MR D. Doerfler, LB&M

1. The purpose of the trip was to brief COL Glowski on the status of the program and to coordinate the upcoming trip to USAREUR.
2. Met with MAJ Nobles to discuss EAC and Corps Nuclear Operations interfaces. He suggested we read two documents both of which were TS. They were Nuclear Operations Procedures/Plan (NOP), and Nuclear Weapons Release Procedures (NWRP). We read these documents prior to leaving DNA.
3. Discussed some follow-on work to this project and also discussed with LTC Moberly exploring the possibility of doing similar effort for Chemical Fire Planning.

D. W. Doerfler
PM

SUBJECT: Trip Report

DATE: 10 October 1989

PLACE: USA Intelligence Center & School, Ft Huachuca, AZ

PARTICIPANTS: LTC Dean Pape, Ch Mat & Log Div, DCD
MR John (Jack) Ordway, DCD
MR L. West, LB&M
MR D. Doerfler, LB&M

1. The purpose of the trip was to brief and solicit comments from the Intelligence Center on the DNA project. A read ahead packet was provided prior to our arrival.

2. The individual (CPT Godwin) who was to provide all of the comments on the functional description document was not present at the meeting. He went on emergency sick call the morning of the meeting. No one else was able to provide any comments or talk to us. He was to provide his comments at a later date. *Comments from the Intelligence Center have not been received. Several attempts were made to obtain the information--calls to CAC and DNA proved unsuccessful.*

3. Discussions with the participants from DCD resulted in the following comments:

- Look at UIRs to see what information is to be passed between BFAs.

- The intelligence process are probably the same for nuclear as for conventional planning. Nuclear targeting requirements for intelligence action must come from MCS and AFATDS.

4. This trip did not provide any real information for inclusion in the functional description document or other documents for the project. It really only provide information to the Intelligence Center that the project was going on and that they (IEW) needed to consider what may be needed from their system to facilitate nuclear planning.

D.W. Doerfler
PM

SUBJECT: Trip Report

DATE: 16 October 1989

PLACE: USA Field Artillery Center & School, Ft Sill, OK

PARTICIPANTS: LTC A. Sleder, TSM, AFATDS
CPT C. Cintron, TSM, AFATDS
MAJ Hutchinson, TSM, AFATDS
CPT J. Mannarino, USAFAS, NWED
CPT S. Bohan, USAFAS, NWED
MR L. West, LB&M
MR D. Doerfler, LB&M

1. The purpose of meeting was to brief and solicit comments from Field Artillery School personnel on the project. LTC G. Turner, Ch, NWED was unable to attend the meeting due to illness. *LTC Turner's comments were received later by the undersigned.*

2. The following comments were provided by the participants:

- Change NUCWARN to STRIKEWARN in the functional descriptions. See FM 3-3 for STRIKEWARN format.

- USAFAS will provide a copy of the latest AFATDS Red Book to LB&M to compare the nuclear planning functions described in it (Red Book) with those being developed byn LB&M.

- When in Europe visit V Corps nuclear planning cell.

3. AFATDS is going to take some of the TAP system and put it in AFATDS to do nuclear planning and or target analysis technical tasks. What LB&M is doing is far more detailed and should be the way to approach nuclear fire planning in AFATDS.

4. NWED personnel wanted to know if a similar effort was being done or would be done for Chemical weapon planning. My response was that we were working with DNA to see if something could be coordinated between DNA and the Chemical School.

D. W. Doerfler
PM

SUBJECT: Trip Report

DATE: 22-27 October 1989

PLACE: USAREUR

PARTICIPANTS: LTC Beck, USA, CENTAG HQ
MAJ Hauptman, German Army, CENTAG HQ
LTC Jonas, Ch, FSE, V Corps HQ
MAJ Deplitch, FSE, V Corps HQ
MAJ Rasmussen, G2, V Corps HQ
CPT Kanning, G3 Ops, V Corps HQ
CPT Towns, NWLE, V Corps HQ
SFC Peltz, NWLE, V Corps HQ
LTC(P) John "Mike" Kain, G3, 3d Armored Division HQ
LTC Winkleman, FSE, 3d Armored Division HQ
LTC Reed, G5, 3d Armored Division HQ
MAJ Steven Rawlick, DNA
MR L. West, LB&M Associates
MR D. Duerfler, LB&M Associates

1. During the period 22-27 October 1989, Lowry West and Don Doerfler travelled to W. Germany and met MAJ Steven Rawlick, DNA. The three of us then visited in order HQ CENTAG, HQ V Corps and HQ 3d AD.

2. The purpose of the visits was to discuss the current work being done by LB&M for DNA on Operational Nuclear Planning. Prior to our arriving in Germany, copies of the LB&M functional description for nuclear planning had been provided to each headquarters by COL Fang the DNA representative in Europe. LB&M was seeking input from each of the organizations as to the correctness of the functional description of nuclear planning at their level of command. It was explained by the LB&M personnel that the document represented a compilation of planning functions that had been derived from reviewing doctrinal publications and visits to proponent agencies for ATCCS.

3. The following is a brief summary of the comments from each headquarters:

CENTAG. LTC Beck (USA), the CENTAG NWLE provided insight as what he does regarding status reporting of weapons and some data on targeting. He also discussed the political situation that is very dominate in the use of nuclear weapons on W. German soil. We then talked with MAJ Hauptmann (Ger Army) who does most of the SEP planning and coordination with each of the corps. He provided some data into how the corps and CENTAG interface and suggested some questions that we might ask when we went to V Corps. He also emphasized the political implications of employing nuclear weapons within NATO. Any decision to use nuclear weapons is a joint decision and has great political overtones. Only LTC Beck had read the document provided by COL Fang. He was very positive in the comments on the work we had done.

V CORPS. Met with FSE personnel as well as representatives from the G2, G3 Ops, and NWLE. MAJ Deplitch from the FSE had been through the document rather thoroughly and liked the detail it contained and could not find fault with any thing we had said; his thoughts were echoed by LTC Jonas, FSE Chief. MAJ Rasmussen from G2 provided some input as to the sensor selection process for doing post strike analysis. All who attended the session were pleased with the effort and encouraged rapid inclusion in C3 architecture. V Corps is using TAPS, but..... The political aspects of the use of nuclear weapons was again brought into the discussion.

3d ARMORED DIVISION. The meeting was held in the G3's office with the G3, FSE Chief and a representative from the G5. The G3 (LTC(P) Mike Kain) had not seen the document; LTC Winkleman (FSE) had been through the document; the G5 rep had not seen it. The G3 was very interested in the work and saw it as something they needed now, not in 1992. LTC Winkleman provided some comments, but in general was pleased with the work. The G3 sent the document to some guys in his plans cell to provide comments--he suspended it for 2 weeks. 3d AD had turned in their TAP equipment, because it could not be supported logistically or technically in Europe. (not a new problem)

4. Specific comments from each headquarters are attached.

5. MAJ Rawlick was pleased with the positive response the work generated. He was going to carry that theme back to DNA. We met briefly with COL Glowaski, DNA (Rawlick's boss) at CENTAG and brought him up to date on the trip.

6. One recommendation if we do a similar effort again. Take the document to the places where comments were to be solicited, explain it and the project purpose, then go back in 6 to 8 weeks and gather the information. While this would incur more travelling, it would probably get a better response. After talking to us the visited headquarters had a better understanding of what was needed from them.

7. There seemed to a high interest factor by all personnel that we encountered during this trip.

8. I provided each primary officer at each headquarters with a company brochure and CATIES brochure.

D. W. Doerfler
PM, LB&M

SPECIFIC COMMENTS FROM USAREUR TRIP

CENTAG HEADQUARTERS

- The EAC NWLE needs reports on the number and type of weapons on hand in the corps; locations of NASPs (for air defense coverage purposes); weapons down for maintenance or lost.

- NWLE directs NASPs and Ordnance units on where, when, and how to move weapons.

- Considerations for planning nuclear weapons:

- Target analysis
- Purpose of use
- Time schedule--how do I account for changes in targets
- How do I refine planning
- Priority of sensors for/between nuclear and conventional
- What is higher guidance, how it is used.

V CORPS HEADQUARTERS

- G2 may have recommended restrictions to the use of nuclear weapons (e.g. tree blowdown on enemy avenue of advance may divert enemy when we don't want to).

- V Corps doesn't use the nuclear weapons in a covering force ops in Europe.

- Nuclear BDA-G2 tasks sensors based on what he knows the target will look like (e.g. radios affected by EMP).

- LB&M functional descriptions very complete and detailed.

- Deception using nuclear weapons is doubtful at corps because too hard to simulate movement with limited transportation assets, detonation for deception purposes is not likely.

3d ARMORED DIVISION HEADQUARTERS

- LB&Ms efforts, if turned into a training aid for commander and staff, will be very useful and helpful to 3AD and others.

- Functional descriptions appear very complete from FSE point of view.

- The G3 said 3AD will thoroughly review the functional description and provide comments to LB&M within three weeks. *These comments were not received despite inquiries by LB&M to DNA asking that 3AD be called.*

DISTRIBUTION LIST

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TRC

15 April 1997

MEMORANDUM FOR DEFENSE TECHNICAL INFORMATION CENTER
ATTN: OMI/MR. BILL BUSH

SUBJECT: Report Distribution Changes

The Defense Special Weapons Agency (Formerly Defense Nuclear Agency) has reviewed the following reports under FOIA actions:

DNA-TR-90-33-V1, AD-B150535
DNA-TR-90-33-V2, AD-B150536
DNA-TR-90-33-V3, AD-B150824
DNA-TR-90-33-V4, AD-B150825

Under FOIA action, these reports are approved for **public release**. Distribution statement "A" now applies.

Arldith Jarrett
ARDITH JARRETT
Chief, Technical Resource Center